

# IRON AGE

NOVEMBER 8, 1951  
VOL. 168, NO. 19

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# DIGEST

## of the week in metalworking

### STEEL SETS RECORDS BUT EARNS LESS

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Steel companies aren't getting rich off the defense boom. The earnings ledger shows that despite constant toppling of sales and output records, steel industry profits are on the downtrend. Higher costs and higher taxes are to blame. Steel isn't moaning but it wants the story known.

### J&L STEEL EXPANSION DEFIES PESSIMISTS

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Doom-criers who shrugged off Pittsburgh as a declining steel center should have hidden their crystal balls as Jones & Laughlin tapped the first of 11 openhearth furnaces at its Pittsburgh Works. By March the 11 furnaces will be producing an annual rate of 2 million ingot tons. That's confidence.

### WAGE TALKS IN THRUST, PARRY STAGE

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Union-industry skirmishes in the prelude to contract negotiations are running true to form. Charges, industry warnings that nothing will be offered to labor are merely setting the stage. Mobilizer Wilson's prediction that there could be no steel strike was seen as a hope without basis.

### U. S. WANTS BUYING CATALOG OF INDUSTRY

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The Justice Dept. is pushing for establishment of a federal central procurement plan. Its backers claim that government access to a complete catalog of manufacturers—large and small—will streamline mobilization buying. Small firms may get a break because of the wish to aid them.

### TAX HIKE MAKES SELLING CARS TOUGHER

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The federal excise tax of 10 pct effective last week will probably make cars harder to sell. Meanwhile cost of raw materials continues upward. Steel prices may also be increased later and auto tooling is more expensive. The only relief may be a drop in cost of getting steel by conversion.

### WEST COAST WAR WORK QUICKENS TEMPO

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Aircraft output is reaching production goals. Auto assembly plants are feeling shortages, but parts suppliers are hardest hit. Prospects for 1952 tungsten stocks are improving. Steel fabricators hit quota delivery lag. Smog controls can really hurt some plants. Coke looks plentiful again.

### REDS HIT HARDER ON TOOLS THAN THE U. S.

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As Americans battle a machine tool shortage here, it may console them to know that the Russians are in a worse situation. A survey of the Russian production machine tool state was recently presented by Comdr. W. T. Greenhalgh before the American Ordnance Assn. Russia still needs imports.

### TOOL STEEL MILL WASTES GIVE UP ALLOYS

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Critical alloys are now being recovered by an electric furnace process which are ordinarily lost in the form of mill scale, grinding chips and other process waste during tool steel manufacture. Every pound of metal recovered adds 5 lb of useful material available for consumers and defense.

### MORE TITANIUM OXIDE IS BEING PRODUCED

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A 54-ft long electric furnace operating under a slight pressure is used to make a high TiO<sub>2</sub> concentrate. Slag containing about 75 pct TiO<sub>2</sub> and iron is obtained. Feed ore is crushed, mixed with anthracite and gravity fed, through a sprung arch roof. This is Part II of a two-part article.

### THREE-DIMENSION PLANS SAVE TIME, MONEY

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With visual, three-dimensional scale models of a plant layout, errors can be minimized. Various arrangements can be tried and easily visualized. Effect of equipment location on material flow can be studied in advance. A method of quickly making inexpensive plant blueprints is available.

### SHEET CONVERSION FADING OUT OF PICTURE

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There's no longer any question that the flat-rolled steel conversion market is softening. It's collapsing. Big conversion users in Detroit are dropping their arrangements like hot potatoes. Unless the trend reverses, sheet conversion will be out of the steel market picture by the year's end.

### VACUUM FURNACE IN SEMI-PRODUCTION USE

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A rugged and practical all-metal vacuum furnace which melts 5 to 50 lb of metal has been built. A minimum of glass or quartz compounds is used. Chief metal of construction is stainless. Either resistance or induction heating units can be employed. Maintenance is reduced to a minimum.

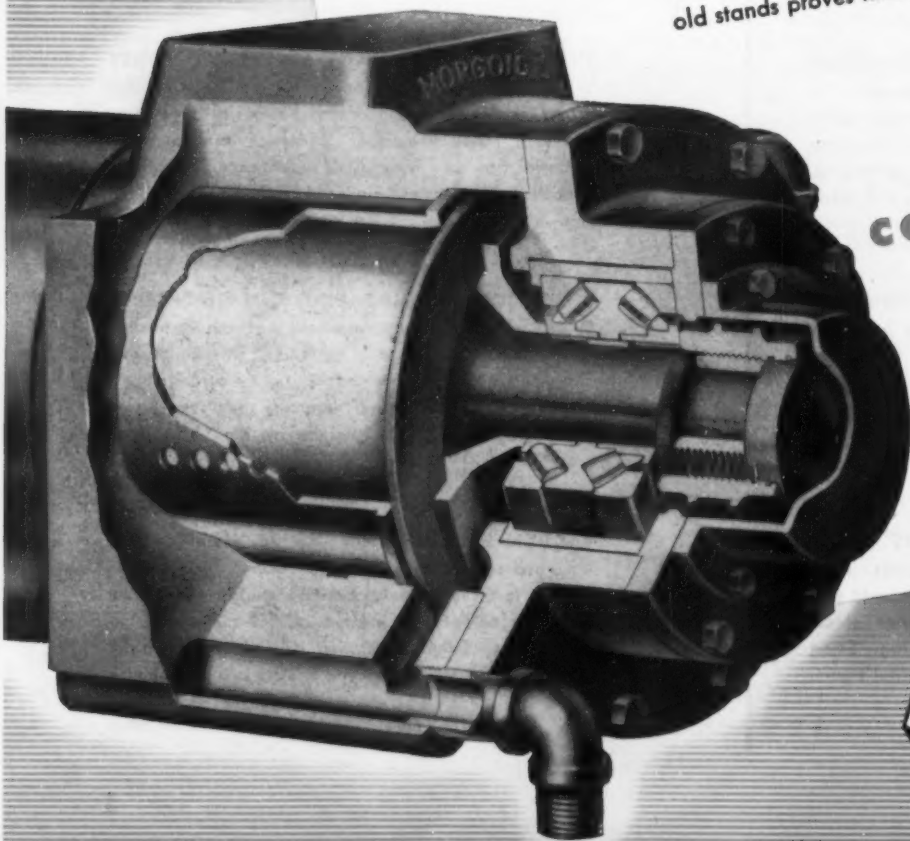
# MORGOIL

## ROLL NECK BEARINGS

...the bearings that teamwork built

Morgoils are not the brainchildren of one man or any one group of men. They developed as the result of years of teamwork between our own rolling mill specialists and numerous experts from among our customers.

The one reason for such interested cooperation by our customers was their need of a better roll neck bearing. The fact that so many Morgoils are going into both new and old stands proves that Morgoils are a good investment.



**MORGAN**  
**CONSTRUCTION CO.**

WORCESTER, MASSACHUSETTS

English Representative  
International Construction Co.,  
56 Kingsway, London W. C. 2, England

**MORGAN**  
**WORCESTER**

Rolling Mills - Wire Mills - Gas Producer  
Machines - Regenerative Furnace Control

## Call Them Back

**A** CHECK on the life and habits of many people who have retired in the past few years doesn't always make good reading.

Those who had hobbies or pastimes built up over the years are doing quite well. Those who were unprepared to start a new type of life are having problems.

People who have spent a lifetime of working with no outside interests have a tough time adjusting themselves when they retire. Major trouble is a feeling of unwantedness.

This feeling of being "out of things" hits some pensioners so hard they just give up and die. In many cases drinking has increased and use of drugs has shown up. Other cases show an increase in mental disturbances.

Some managements are training younger workers how to adjust to a retirement period. The start has to be made long before the worker leaves the plant. Some companies are doing what they can to cut down this feeling of isolation among present pensioners.

People on Social Security can earn up to \$600 a year before government payments are stopped. Many pensioners can and should have some occasional work to do—if they are able.

We have a manpower shortage. Many pensioners were skilled workers. They could be used as skilled workers in plants, as teachers for new employees or for special jobs. Their tour of duty and pay could be set up to conform to the \$600 a year allowance.

If exceptionally gifted and able to do a skilled job they could temporarily go off Social Security with a regular pay check during the emergency.

Such a plan would help the person, the company and the country. Out of it might come a new and healthier attitude towards people who have retired but who seem to be unable to completely adjust themselves unless they have a little outside work to do.

*Tom Campbell*

Editor



# Shell Game with a New Twist...



## SHARON\* HIGH CARBON STRIP STEEL GOES INTO 20 MM. SHELL LINK

THE LINK represents one of those tough little problems of engineering. The part is needed in millions. The tolerances in manufacture are so exacting as to make it a precision production job. Sharon High Carbon Strip, fed from Sharon Steel Corporation, is being used regularly on this job. For this application a heat treatable spring steel with exceptional good forming qualities is used. The use of strip aids high speed production. Big Sharon coils reduce down time too.

### SHARON STEEL CORPORATION

*Sharon, Pennsylvania*

DISTRICT SALES OFFICES: CHICAGO, ILL., CINCINNATI, O., CLEVELAND, O., DAYTON, O., DETROIT, MICH., INDIANAPOLIS, IND., MILWAUKEE, WIS., NEW YORK, N. Y., PHILADELPHIA, PENNA., ROCHESTER, N. Y., LOS ANGELES, CALIF., SAN FRANCISCO, CALIF., MONTREAL, QUE., TORONTO, ONT.

For information on Titanium Developments contact Mallory-Sharon Titanium Corp., Indianapolis 6.

SHARONSTEEL

# Dear Editor:

## Radiant Heat

We have read the article "Radiant Heat: Steel Leads Market Race" by V. Packard in your Oct. 18 issue. We found it very interesting and can agree with your appraisal of the potentiality of radiant panel heating. We are also glad that you gave credit to the A. M. Byers Co. for the early pioneering of this new industry in the United States.

Your statement about pipe makers having jumped into the lead in the radiant heating derby is likely true, but it seems that it would have been fair to mention that this is largely so because the use of copper tubing for that purpose has been prohibited by the U. S. Government.

Apropos of your statistical information, the recent Housing Materials Survey of the Housing and Home Finance Agency shows that for water piping in houses 47 pct of all the piping used throughout the country was of copper during the first 6 months of 1950 as compared with 29 pct in the full year of 1940. It also reports that for heat distributing materials and specifically piping for boiler systems 76 pct for the first 6 months of 1950 was of copper as compared with 8 pct in the full year of 1940.

This you will probably agree is quite a remarkable gain and although the proportions may not exactly apply to radiant heating, it indicates at least a trend which we are quite sure prevails in practically every trade where pipe and tubing is used.

H. E. VOGELI  
Development Engineer

The American Brass Co.  
Waterbury, Conn.

## Up To Date

In view of the many recent changes and improvements in beryllium copper, much of the specification data for this alloy appearing in "Nonferrous Alloy Specifications" by N. E. Woldman in your Oct. 4 issue is no longer applicable.

The following points should be considered before specifying beryllium copper on the basis of this listing:

(1) ASTM B195 has been withdrawn, while important changes have been issued in B194, B196 and B197 since the listed 1949 tentatives were published.

(2) U. S. Air Force 11070-A was superseded in 1947 by AN-C-166 and AN-C-167; however, these latter specifications were subsequently

## Letters from readers

superseded by MIL-C-6941 and MIL-C-6942 in 1950.

(3) U. S. Navy 46C11a has apparently been recently cancelled.

(4) Aeronautical material specification 4530E should read 4530B.

(5) The important government-issued military specifications have been omitted. These include MIL-C-947, MIL-C-6941, MIL-C-6942 and MIL-H-7199.

J. T. RICHARDS  
Development Engineer

The Beryllium Corp.  
Reading, Pa.

## Vacuum Furnaces

Sir:

Please tell us where we can get further information on the vacuum furnaces mentioned on the Newsfront page of your Oct. 11 issue.

W. H. BLEECKER  
Chief Metallurgist

Carbide Alloys Div.  
Allegheny Ludlum Steel Corp.  
Detroit

Further information can be obtained from J. M. Taub, Los Alamos Scientific Laboratory, Los Alamos, N. M. A full technical story on the vacuum furnaces will appear in the Nov. 29 issue of THE IRON AGE.—Ed.

## Personal Pickup

Sir:

On p. 65 of your Oct. 18 issue you published a list of items which the government has released for bids.

It would be appreciated greatly if you could provide us with information relative to where this information can be obtained at an earlier date than the issuance of your magazine—in order that sufficient time is allotted for obtainance of said data and submission of the desired bids.

W. B. POPE  
Chief Engineer

Engineered Enterprises  
Detroit

Information on government bids is supposed to be available on Monday mornings at your local Commerce Dept. office. You will have to pick it up each week—they won't mail it.—Ed.

## Steel Specifications

Sir:

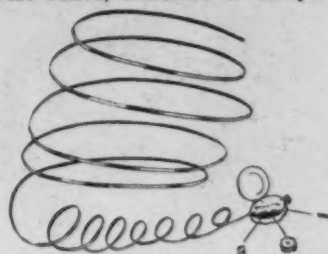
We would appreciate your advising us where we can get a publication designating the Army specification on steels.

C. J. ZIMPFER  
Western Supplies Co.  
St. Louis

Sorry we don't know of any current consolidated specifications listing. But your local Army Ordnance, Engineer, Quartermaster, etc. office should be able to help you on the various specifications of the Defense Dept., the federal specifications, etc. We plan to publish all steel specifications in our annual issue of Jan. 3.—Ed.

## LET'S TALK SPRING

(Flat rolled, annealed or tempered)



Whatever your spring steel requirements, in annealed or tempered, you'll find a wide variety of usual and unusual finishes at Kenilworth. And you can count on Kenilworth's cooperation in meeting your exacting requirements, too—certain of accuracy to specifications in order after order.

## LET'S TALK SOURCE



Kenilworth's specialized spring steel department is well stocked with a wide selection of types, sizes and finishes. Quick handling of your order is assured—when you phone or wire there is no delay, current "in stock" inventory records make possible immediate response. Try us on your problem or requirement today.

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## LET'S TALK ABOUT ALL OF KENILWORTH'S SERVICE

Custom slitting and shearing service for your metals to handle sizes from .001" to .187" in widths up to 36" is available—precision equipment assures minimum camber, minimum burr and closer than standard tolerances when required.



WAO 3908

Machines are vital—  
*but men come first*

In some plants, it is *machines* plus men in today's race for volume. In our plants the men come first—it's *men* plus machines . . . because it is the experienced skill and pride of a craftsman that makes all the difference in quality. Craftsmanship is the unseen factor that controls the exacting uniformity of Columbia and Summerill products.



*Columbia* STEEL & SHAFTING COMPANY  
SUMMERILL TUBING COMPANY DIVISION  
PITTSBURGH 30, PENNSYLVANIA

SPECIALIZING IN COLD FINISHED STEEL BARS and SEAMLESS STEEL TUBING



## THE IRON AGE Newsfront

► Look for more government pressure to step up recovery of steel from slag. Defense production people in Washington would like to see this source increased to a 500,000-ton a year yield. But problems of personnel, and perhaps financing, make this figure look too big.

► Unlike copper or iron, the coal mining capacity of the U. S. is now considered academic. Reason: There are not enough cars to haul all the output if mines were worked at capacity. Despite big backlog of freight car orders, the fact is railroads have not been ordering coal cars as fast as other types. And if they had them now they wouldn't all be needed.

► A big production foundry is now being converted to produce all its castings by the Croning process. While this may not be the first it is certainly the first of any real size to completely switch from conventional practice to the new technique.

► Electric smelting of iron ore into pig iron is scheduled to play an important role in Norway's expanding steel industry. New plant at Mo i Rana is expected to be the largest of this type in the world. Aim is to take advantage of the country's cheap water power plus local ore.

► Boron steel alloy production for this year will add up to about 600,000 net tons—which is a lot less than many associated with the development had expected. Some 70,000 tons were melted in October but the November melt schedules are light.

As a result NPA will soon apply strong pressure to get these steels into wider use.

► The pressure for conversion steel is leaking out fast. The amount of conversion steel tonnage to be used by the auto industry during the first quarter of 1952 has been sharply reduced. Ingots could be bought in Detroit last week for less than \$70 a ton.

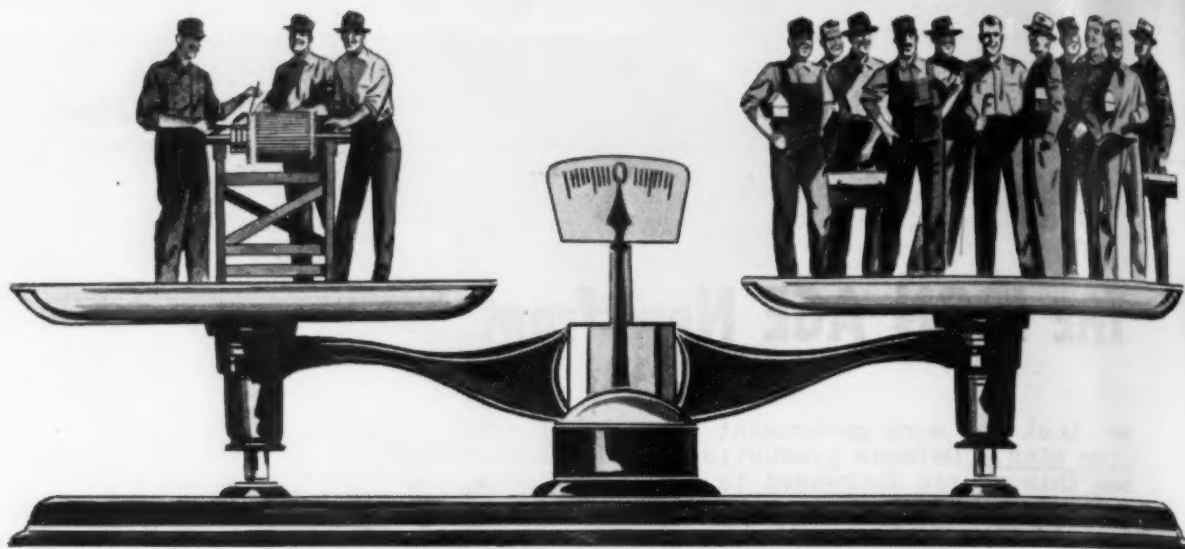
► British power authorities last week put into operation their plan to broadcast radio warnings to give industry short notice of impending power cuts. Only in the industrial Midlands will British follow U. S. practice of notifying customers by phone.

► The recent Government blast at the three aluminum producers—calling them a monopoly—would be laughable if it did not have such a serious effect on the everyday life of these firms. Not long ago Washington charged Alcoa with being a monopoly, helped Kaiser and Reynolds get into the business, then implied everything was OK. Now the cycle starts again.

► The threatened ban on the use of chromium for automotive trim was halted for at least two reasons: (1) Military demand did not come up to expectations; and (2) several small auto companies would have had to suspend operations.

► Aided by a new resistance method for joining aluminum wire, the use of aluminum wiring harness by automakers may come along faster than expected. One problem with aluminum wire is that supports or loops may be needed to prevent fatigue failures.

► The steelworkers drive for a big pay boost will be more militant than it has been in years despite Washington feeling that an "amicable" settlement will be made.



## \$370 INVESTED IN SILICONE INSULATION SAVES \$80,000 IN MAN-HOURS ALONE

TRAVELLING CRANE MOTORS insulated with Class B materials had a normal life expectancy of only 20 days in a large southern foundry. At least 2½ to 3 hours were required to change motors. Down-time cost \$1000 an hour in lost man-hours or \$2500 for each failure. That amounts to over \$40,000 a year in lost man-hours alone.

OVER TWO YEARS AGO, three crane motors, rated at 15, 30 and 50 hp, were rewound with Silicone (Class H) materials at an additional cost of about \$370.00. Still in service, those Class H motors have already saved \$80,000 in labor plus the cost of re-

winding with Class B materials plus the value of lost production.

THAT'S TYPICAL of the performance of motors protected with Class H insulation made with Dow Corning silicones. They last at least 10 times longer than the next best class of motors. They also have at least 10 times as much wet insulation resistance. That's why more and more military and industrial engineers are demanding Class H equipment. That's why more and more design engineers are specifying Class H equipment. And that's why Class H is becoming more readily available from motor manufacturers and rewind shops.

**WRITE,  
RIGHT  
AWAY**

to DOW CORNING CORPORATION, MIDLAND, MICHIGAN

Please send me ☐ List of Class H Motor Manufacturers O-11A  
☐ List of Class H Rewind Shops O-11B

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Title or Dept. \_\_\_\_\_  
Company \_\_\_\_\_  
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City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_



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# PROFITS: Steel Sets Records, Earns Less

**Industry isn't getting rich off defense boom . . . Taxes take big bite . . . Fear labor may ask wages to endanger industry . . . Profit margins are dangerously thin—By W. V. Packard.**

Anyone who thinks steel companies are getting rich off the defense boom should take a look at their balance sheets. Despite consistent overthrow of records in production, sales, shipment and expansion, steel earnings are on the decline. Higher costs and higher taxes are to blame.

Steel leaders aren't crying the blues about this. But they do wish more people knew the facts. Actually, most steel men believe in a pay-as-you-go defense program. And they take it for granted that they should pay their share. They expect the same of others, and several admonished that the money should be spent wisely.

**Dangerous Carving**—What worries them now is that they fear the steelworkers and the government will try to carve a wage increase out of their "fat" earnings and end up cutting the vitals of the industry.

Third quarter earnings of the nation's eight top steel producers (rated on capacity) fell 42 pct short of the same period last year. And their earnings for the first 9 months this year are 23 pct less than they were during the same period in 1950.

This doesn't mean that steel companies are headed for bankruptcy. Expressed in dollars, their earnings still sound impressive. That's because of their record-shattering volumes of production and sales and their all-time high capacity. What it does mean is that profit margins are dangerously thin—and still shrinking.

**Taxes Hurt Most**—Federal in-

come taxes are the biggest reason. Under the new, retroactive tax law it was necessary for companies to adjust financial data previously reported for the first half of 1951. A look at U. S. Steel's ledger will give you some idea of the tax bite. During the first 9 months of this year their estimated federal income tax came to \$295 million, compared with \$147.1 million last year—an increase of just about 100 pct.

Their net income for the first 9 months of 1951 was 5.2 pct of sales. During the same period last year income was 8.4 pct of sales.

All these figures are based on capacity operations. What would

the story be if the industry's operating rate were 75 pct of capacity or less? None can say exactly, but all agree it would be much worse. That's why they are keeping their fingers crossed, hoping that apparent soft spots in the market are only the result of tight government controls, not a failing of free market demand.

**Sternest Warning**—Eugene Grace, Bethlehem chairman, sounded the first and sternest warning. "In a very few months we will be curtailing finished steel output," he predicted. He asserted that steel demand is "fantastically" inflated. Pointing to structurals, the most oversubscribed steel item in the Controlled Materials Plan, he declared that inquiries had been falling for months, and his firm

## Steel Company Earnings

Company	Third Quarter '51	Third Quarter '50	Nine Months '51	Nine Months '50
U. S. Steel	\$27,936,060	\$59,742,302	\$134,733,557	\$178,821,540
Bethlehem Steel	18,460,372	33,563,841	67,155,347	90,804,414
Republic Steel	12,496,763	18,682,542	39,226,256	56,384,618
Jones & Laughlin	8,101,000	11,233,000	23,837,000	26,481,000
National Steel	10,585,971	14,042,525	34,479,198	43,091,331
Armco Steel	6,094,354	12,037,344	26,739,056	37,743,114
Youngstown S & T	7,194,334	10,945,138	23,549,078	29,221,911
Inland Steel	7,748,751	9,080,058	25,261,849	27,308,524
Wheeling Steel	3,326,610	5,787,322	11,733,307	13,232,467
Colorado Fuel & Iron	2,045,711	2,545,611		
Sharon Steel	2,163,061	2,706,647	7,216,005	6,196,984
Crucible Steel	2,018,579	1,991,555	6,625,910	4,055,631
Pittsburgh Steel	926,284		4,937,457	3,655,942
Barium Steel	614,206	511,775	3,749,330	599,774
Allegheny Ludlum	2,213,161	2,873,998	7,324,240	7,445,169
Alan Wood Steel	327,307	628,081	1,721,104	1,628,540
Rotary Electric	815,624	558,017	2,154,932	1,353,410
The Midvale Co.		47,520	1,068,886	274,086
Continental Steel	268,085	758,722	1,316,918	2,469,512
Keystone Steel & Wire	1,117,677	1,460,536		

*Italics indicate loss*



## DIE SHOPS: Stalled on Wages

**WSB turns thumbs down on increases ranging up to 50 pct . . . Tool and die men meeting in St. Louis aren't sorry . . . Want saner wage hike policy . . . Shortages plague many centers.**

Tool and die makers — whose products start the chain reaction to volume defense production — have not yet won a fair system of wage rises that will enable them to preserve their small but precious labor force and pad it out for expanding defense needs.

While the National Tool & Die Manufacturers' Assn. was meeting last week in St. Louis and keeping the focus of complaint on manpower shortages, the Wage Stabilization Board in Washington turned down proposed higher wages for the industry. A special committee had recommended increases ranging up to 50 pct.

**Not Sorry**—Tool and die men queried at St. Louis were not gnashing teeth at the refusal. Most felt the proposed increases were too high. They were glad that the Board had refused to withdraw the field's ability to grant merit increases under the so-called "random rate" shops provision of General Wage Reg. 5. But they are still waiting for a sane policy on wages to permit increases that will hold the working force, attract new people, without causing financial distress and inflation.

Manpower as usual was the chief concern of members of NTDMA in St. Louis. Speakers and informal talk pinpointed acute shortages of skilled labor in many areas throughout the country. Training course for a full-fledged tool and die worker is equivalent to a college education, it was pointed out.

Once trained—over a period of years—a tool and die craftsman is invaluable to his firm. Numerically, as compared to mass production industries, the working force is small and sensitive to any raids either by the military draft or by large de-



"Carefull He's always testing yield points."

## Special Report

Continued

had started gnawing at its backlog of orders.

Irving S. Olds, U. S. Steel chairman, sees a firmer market. "Demand with us continues as strong as ever," he reported. He sees "heavy steel" requirements of the type needed for expansion projects continuing on a large scale into the foreseeable future. "Our backlog for fabricated structurals remains the same; if there is any

falling in inquiries I believe it's solely because people feel there isn't any use inquiring." He reported that U. S. Steel is having trouble getting structurals for its own new Fairless Works which is now about 30 pct completed.

He admitted that flat-rolled steel of the type used in autos is getting easier. But he said he didn't know how much this resulted from government restrictions.

fense firms expanding their die shops and throwing cash around.

Shortage comes at a time when the industry has the biggest backlog of orders in its history. Most of this—as much as 90 pct in some areas—is defense work.

**Universal Need** — Practically every tool and die shop in the country needs more manpower. There is room for 1000 skilled workers in the Chicago area. In Rochester, N. Y., contract shops are seeking 300 to 350 more men.

Randolph H. Cope, newly elected president of NTDMA, and vice-president, The Bunell Machine & Tool Co., Cleveland, reports his area can use 300 more men. Indianapolis needs 250 workers; Dayton 300. St. Louis is seeking "several hundred" and western Massachusetts "hundreds."

**Elect Officers** — New officers elected by the association, besides Mr. Cope, are: Alfred Reinke, Gus Reinke Machinery & Tool Co., Hillside, N. J. first vice-president; Herbert C. Murrer, Murrer Tool Co., Cincinnati, second vice-president; Herbert Harig, Harig Manufacturing Corp., Chicago, treasurer; and Joseph N. Huser, B & H Specialty Co., Indianapolis, secretary.

## War Spending Hits \$45 Billion

Military spending in the 15 months following the outbreak of the Korean war hit a total of \$45,000,000,000—not including pay, allowances and administration.

Hard-goods procurement and firm commitments total up to \$37,300,000,000. This includes aircraft, ships, tanks, weapons, ammunition, and similar supplies.

About \$4,900,000,000 went into soft goods, including clothing, food, and gasoline and oil, while the military construction program cost \$2,200,000,000.

Military spending in the period July through September was at the rate of more than \$1,000,000,000 a week, for a total of \$13,300,000,000.

## IRON POWDER: Plentiful, Growing

**Very few shortages to date . . . Imports, production, capacity growing faster than use . . . Ordnance demand could offset balance . . . Industry confident, aggressive—By R. L. Hatschek.**

Iron powder is a material you can still get. Despite increasing consumption, there are still no serious shortages. A few spot shortages of certain types or sizes have occurred. Quoted delivery time is short. Supply is well ahead of demand in most cases.

Imports and domestic production have been climbing steadily and the industry is expanding rapidly. Supply has been rising

### Imports of Swedish Iron Powder (net tons)

1948	2,590
1949	3,108
1950	8,273
1951	10,750 (estimate)

almost faster than seems necessary and still the industry is expanding.

Hoeganaes Sponge Iron Corp., for instance, is building a plant in Riverton, N. J., which will have an annual capacity of 30,000 tons. This plant is scheduled to begin operations late in 1952. Others are also building to raise domestic production which in 1950 totaled only about 4125 tons.

**Market May Change—Possible** new Ordnance Dept. projects, such as the iron powder rotating band program, could supply markets to new capacity if they were adopted. Several other Ordnance rotating bands projects are still in the experimental stage.

Early this year many manufacturers were expected to switch over to iron powder for various reasons—shortages of other materials, ease of fabrication, etc.—but the conversion has not taken place as rapidly as anticipated. And yet this industry is optimistic and aggressive.

Iron powder people are out to nip shortages before they start—and avoid controls. They have confidence in their product and

anticipate peacetime markets large enough to justify current expansion. They also want to be prepared for any emergency demand.

### New Furnaces Use Pressure Tops

Six large blast furnaces now being built in this country will use the new pressure-top method of operation, according to Dr. B. S. Old, vice-president, Arthur D. Little, Inc. He also revealed that five old furnaces are now being converted to pressure, in addition to eight now operating in U. S. and one in England.

These furnaces will produce an estimated extra 1,000,000 tons of pig iron yearly. Furnaces now



**WIND TUNNEL:** Performance of a full-scale ram-jet engine for a guided missile is checked in the 8 x 6 ft test section of National Advisory Committee for Aeronautics' supersonic wind tunnel. Tunnel is at Lewis Flight Propulsion Laboratory.

building will have an average output of at least 1600 tons per day, and the older, converted furnaces 1400. Increased output and more efficient use of coke cut operating cost.

### Little Production Rise in Sept.

Federal Reserve Board reports that the rise in industrial production during September was not as great as had been expected. New level is 219 pct of the 1935-39 average, 2 points higher than the August record, but considerably below the high of 223 pct set in April. Reason: Cuts in production of consumer goods have not yet been balanced by increased defense production.

New contracts for construction continue to drop in September, FRB reports, but the number of new housing starts gained somewhat. Automobile dealers and department stores reported slack business, but all other retailing areas told the government sales were up during the month.

### Cast Airplane Die Rejects Cut

New methods for eliminating warping and shrinkage in the casting of airplane dies—one of the biggest bottlenecks in the aircraft industry—were demonstrated in Chicago last week. Demonstration climaxed 8 months of research by Armour Research Foundation of Illinois Institute of Technology under Air Force contract.

Planemakers have long been bothered by dies shrinking and warping while cooling in the sand molds. Remelting and repouring are expensive processes. New methods are aimed at controlling deformation so a die need be cast only once.

### Alabama Blast Furnace Blown In

Woodward Iron Co.'s No. 4 blast furnace, the first commercial blast furnace built in Alabama since 1908, was blown in yesterday at the company's plant at Woodward. It will produce 650 gross tons of pig iron per day.

## STEEL: J&L Growth Defies Prophets

**J&L shows confidence in Pittsburgh as steel center . . . Disregards predictions that it's slipping . . . New openhearth is first of 2 million ton furnace battery—By J. B. Delaney.**

Pessimists who shrugged off Pittsburgh as a declining steel-making center should have hidden their crystal balls last week as the first hot metal gushed from a new 250-ton openhearth furnace installed by Jones & Laughlin Steel Corp.—in its Pittsburgh Works.

The completed openhearth will be joined by ten others that by next March will be producing at an annual rate of 2 million ingot tons. Start of the first major increase in steelmaking to be realized in the postwar crisis, tapping of the openhearth was J&L's answer to predictions that Pittsburgh was losing its grip.

**A Cheer for J&L**—Watching the hot steel flow last week, some 300-odd onlookers broke into a spontaneous cheer. It was a cheer not only for the important new capacity adding to America's industrial might but for J&L determination and confidence in defiance of the doom-criers. J&L people did not see the same handwriting on the wall. If they did, they wiped it clean and remade the trend.

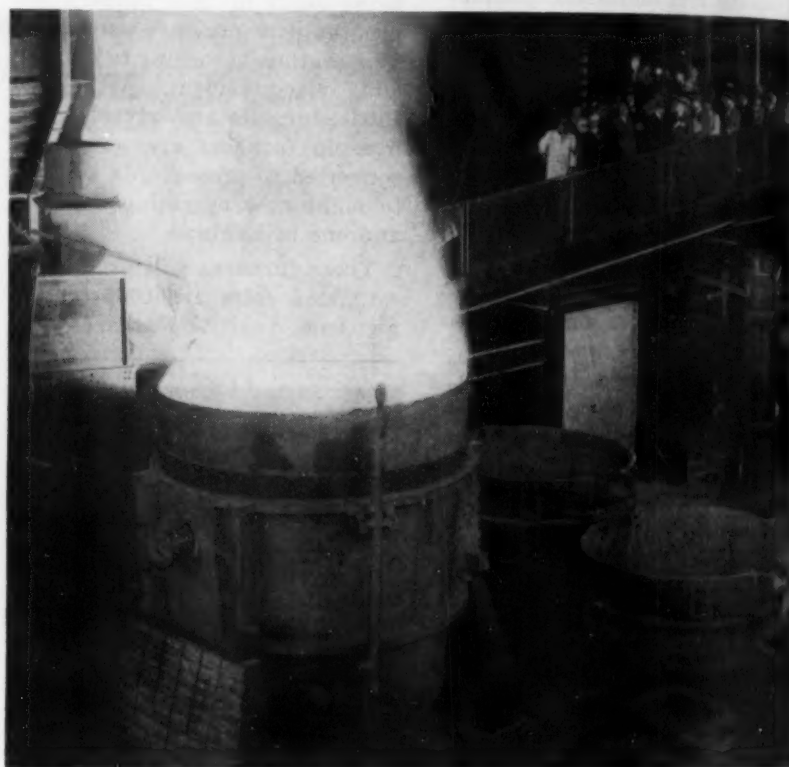
When observers said there was no room to expand, J&L made room—by relocating a community. The firm will spend \$103 million in expanding its Pittsburgh plant—\$70 million for the openhearth shop.

**J&L Spirit**—Although there were no brass bands to make it obvious, the *esprit de corps* of the J&L crowd dominated the show on Tuesday. No one had to mention it. It was there. A flavor of prestige and color was added to the occasion by distinguished speakers, including Mobilization Director Charles E. Wilson.

Despite operating capacities of

2 million tons per year, the new openhearths will give the Pittsburgh Works a gain of 1.2 million tons. They will make possible the replacement of 780,000 tons of obsolete capacity.

Capacity of Pittsburgh Works will be raised to 3.3 million tons.



Including new capacity at the Otis Works, overall J&L potential will rise from 4.8 million tons to 6.4 million tons.

Pittsburgh still holds its dominant position as a steel-producing center. Present Pittsburgh district capacity of 22.4 million tons is 21.44 pct of the national total. In second place is Chicago with 19.7 million tons and 18.91 pct of the total. Youngstown is third with 13.1 million and 12.6 pct.

**Relocating Community**—Seventeen months ago part of the 10-

acre site on the south bank of the Monongahela River was a blighted residential area.

With the cooperation of Pittsburgh civil authorities, 296 families were relocated. The property was bought by J&L without public subsidy. Some of the credit for the amicable transplanting of these families goes also to the CIO United Steelworkers of America.

This part of the job was not easy. It's impossible to uproot that many families without some headaches. But it was the only

way J&L could expand, and it was accomplished through understanding, patience, and a lot of hard work.

**Spending Schedule**—The new facilities are just a part of the \$400 million J&L will have spent from 1946 through 1952, the program's scheduled completion, for modernization and expansion. Of the \$200 million to be spent this year and next, \$103 million is being invested at Pittsburgh Works, \$43 million at Aliquippa,



## Expansion

\$34 million at Otis, and \$18 million in new raw materials facilities.

The new furnace will consume approximately 70,000 tons of scrap per month at capacity operations. This will mean a 7½ pct increase in the overall district scrap consumption, making Pittsburgh more of a scrap-minus area than ever.

In times of a normal scrap market, J&L would have a substantial stockpile on the ground waiting for this burst



**FIRST HEAT:** At left, industry and government brass watch first heat of steel from new J&L openhearth shop being poured into ladle. Above, Defense Mobilizer C. E. Wilson pushes plunger to tap the furnace.

of new steelmaking capacity to come in. The touch-and-go scrap supply of today and the NPA allocations system doesn't permit heavy stockpiling. As the openhearths come in they will be fitted into the scrap supply picture under the allocations scheme.

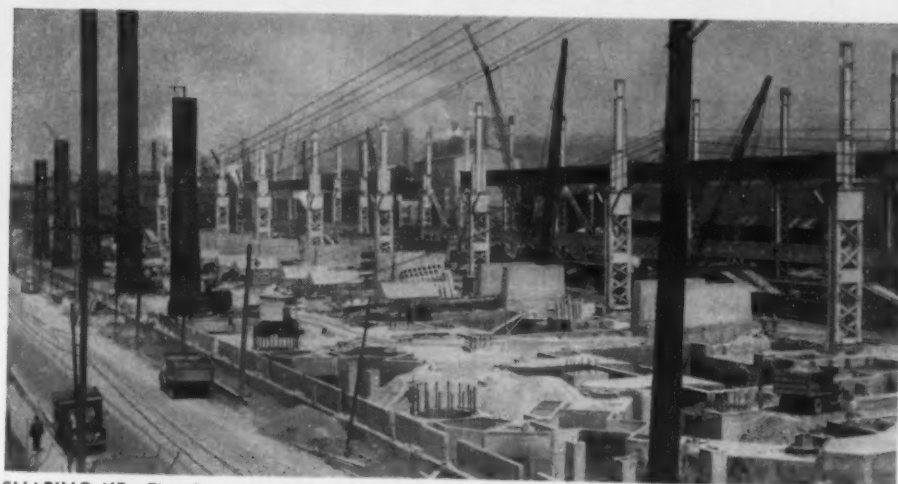
To assure uninterrupted production, furnaces are designed for firing with gas, oil, tar. Storage facilities for nearly 8½ million gals. of liquid fuel are provided. Facilities include two 800-ton hot metal mixers.



**BEFORE:** View of openhearth shop site in 1949 before houses were torn down.

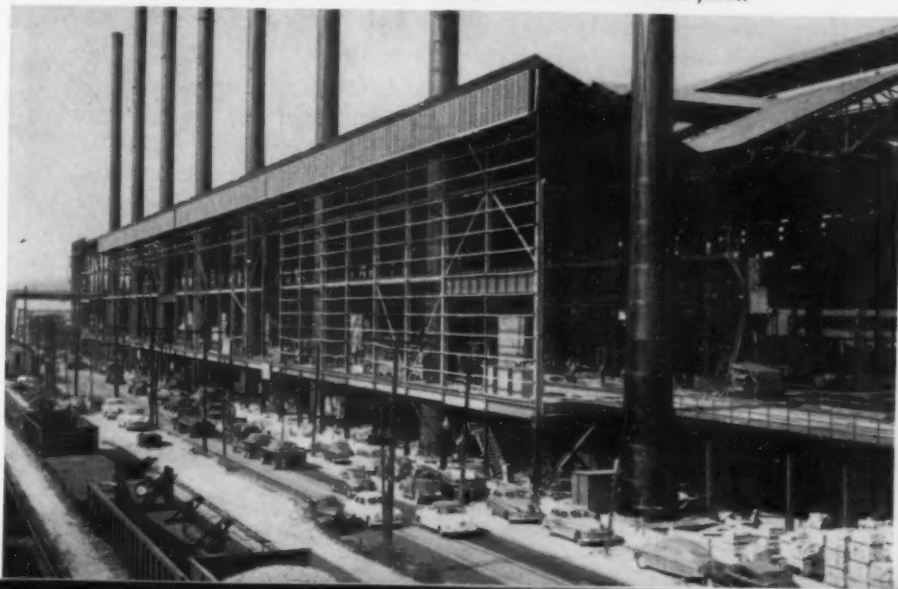


**FOUNDATION:** Pile drivers hammer 26,500 tons of steel into 6875 foundation piles.



**SHAPING UP:** First five of 11 250-ton stacks start up on their concrete foundations.

**SKELETON:** Framework of main openhearth building, with rail classification yards.



## WAGE TALKS: In Thrust, Parry Stage

**Union-industry skirmishes follow same old pattern . . . Statements now cause scarcely a ripple . . . Mobilizer Wilson's no-strike forecast seen as without basis—By J. B. Delaney.**

So far union-industry skirmishes preliminary to steel labor contract negotiations are running true to form. People who have been through it before are inclined to yawn.

What has happened so far has been accepted as part of a well-worn pattern that doesn't mean a thing.

Eugene Grace's comment that Bethlehem Steel Corp. will have nothing to offer the CIO United Steelworkers of America caused scarcely a ripple.

Neither did the remarks of Philip Murray, union president, castigating the "steel industry" for its alleged lack of interest in the welfare of its workers.

**Had to Say It**—The comments of Charles E. Wilson, Mobilization Director, interpreted by some as a prediction there would be no steel strike, were not taken too seriously either. Mr. Wilson said only what he might be expected to say. His remarks were more in the nature of a hope rather than a firm forecast.

Meanwhile, the USW has notified most of the basic producers of its intention to reopen the contract. This was done in accord with the provision that such notice be given 60 days before contract expiration.

The notification also constituted a compliance with provisions of the Taft-Hartley act that intention to strike must be voiced

within that period. The union may also be expected to certify 30 days before the contract that a dispute with the industry exists.

**Murray Maneuvering?**—Whether there will be a strike is anybody's guess. Most people are convinced we will come mighty close to one. Some believe there will be a strike of short duration before the government takes over and works out a settlement on wages and prices.

Some observers feel Mr. Murray will try to get what he wants in an oblique way, maneuvering to avoid the stigma of punching another hole in the cost-of-living wage ceiling. They believe he will ask for a wage increase within the framework of the Stabilization Act but will seek additional wage boosts on the basis of increased productivity of steel workers. At any rate, the end result would be increased cost to the steel companies of 15¢ per hour or more.

First real hint of what the union wants will come Nov. 14-16 when the USW International executive board and wage policy committee meets at Atlantic City to formulate demands.

### Strike Closes All T.C.I. Works

"Wildcat" strike of some 100 coke oven workers completely shut down Tennessee Coal, Iron & Railroad Co. last week. Negotiations were still deadlocked at presstime. Arthur V. Wiebel, president, T.C.I., said more than 26,000 employees were idle. An estimated 9000 tons of steel production were being lost each day.

Strikers went out Oct. 26, claiming extra summer help on oven "hot jobs" had been laid off. T.C.I. replied men had not been discharged, merely reassigned to other jobs for the winter.

Iron ore miners struck in sympathy Oct. 31, and all local operating unions went out the next day.

Union locals have refused to negotiate until the 37 suspended men are reinstated. T.C.I. points to statements by USW officials calling the strike illegal and unauthorized.

### WSB Approves J & L Work Plan

Jones & Laughlin Steel Corp. and the CIO United Steelworkers of America have adopted a new approach to the problem of rewarding workers for extra effort on the job. Called "full equipment utilization," the plan is outlined in a memorandum of agreement signed Sept. 25 and approved last week by the Wage Stabilization Board.

The program may or may not result in higher pay for individual workers, depending on the type of work and present incentive earnings, but both the company and the union feel the opportunity for higher incentive pay is greater than under the old workload philosophy. The company believes also that the plan will mean better use of equipment.

The term "full equipment utilization" is defined as "practical production capacity" rather than capacity that could be realized under the best possible operating conditions.

According to the agreement, a direct production worker will earn his standard hourly rate when equipment is used at 74 pct or less of full equipment utilization. This is called the "make-out" point. As the equipment is used more efficiently, the worker's earnings rise until at 100 pct of equipment utilization he is earning 135 pct of his standard hourly wage rate. The extra 35 pct is not an earning limit. It is expected that some workers and crews will frequently, even regularly exceed 35 pct.

In the case of workers contributing indirectly to attainment of full equipment utilization, it is expected that the percentage over standard hourly rate will range between 10 pct and 20 pct.

# IRON ORE: Europe's Supply Limited

**High shipping costs rule out overseas ore . . . England leans more heavily on imports as own sources dwindle . . . France is surplus area . . . Germans buy as much Swedish ore as England.**

Europe must depend on her own iron ore sources and on those of nearby areas. High transportation costs preclude any extensive use of sources in South America or Asia. This is the general conclusion of a recently-completed British Iron and Steel Federation survey of world ore reserves.

**Imports Rise**—Great Britain is leaning more and more heavily on imports as her own reserves become exhausted. French North Africa and Sweden are now her principal suppliers. Significant quantities also come from Newfoundland, Sierra Leone, and France. Spanish ores, once predominant, have declined steadily since the early twenties.

France relies mainly on her own mines, and sells large quantities to Belgium and Luxembourg. Postwar coke shortages led Belgium to step up her imports of rich Swedish ore, but this is believed to be temporary.

**Use Down**—Prewar Germany was by far the biggest buyer of Swedish ore. Now, reduced operations, her imports from that source are about equal to Britain's. Native German ores are of low quality, but beneficiation projects are growing. Germany still imports a third of her needs. Lately she has become interested in sources farther away, including India.

**Not That Big**—Russia's reserves are immense, but British Iron and Steel Federation ignores estimates that claim a half of the world's supply for USSR. Mines lie mostly in Europe, with comparatively few deposits in Asiatic Russia.

China's high-grade deposits will supply her own blast furnaces,

which have a capacity of about 1,000,000 tons of pig iron a year. Korean capacity is rather less, but the large deposits of Korean iron ore lie mostly in the north. Manchuria formerly produced about 3,000,000 tons of pig iron yearly, and has ample supplies of ore.

**Still Looking**—Little change is expected in present supply patterns when conditions become more normal. There is still keen interest in any ore source in reasonable distance of European steel plants.

## Copper:

**Chase sees no danger of losing its markets to other materials.**

"We are not worried about losing our markets to other metals," W. C. Husted, executive vice-president, Chase Brass & Copper Co., Inc., told THE IRON AGE last week. "Our principal concern now, of course, is getting enough metal. But our long-term estimate

is that we'll have—or develop—enough copper and brass product applications to sustain a good level of business. In other words, there will be a sufficient demand for whatever copper is produced for those applications where copper is by far the best material for the job."

**War Work**—R. D. Ely, vice-president in charge of production, said that Chase's mills and fabricating plants are devoting about 25 pct of their output to direct military products, largely in ammunition components. They are also supplying sheets to be clad to steel to make small arms bullet jackets of the type used extensively during World War II. Next year Chase will start on a contract to make steel cases for artillery ammunition.

Mr. Ely's remarks were made at a press conference in connection with an open house at the Chase Metal Works, Waterbury, Conn. The open house, attended by some 30,000 visitors last week, was one of the events celebrating the 75th year of the firm's corporate existence.

Chase is running three shifts 4 days a week, which is about 60 pct of what could be done if more materials were available.



**ONE-FOR-TWO:** This 15-ton ore bridge with an hourly stocking capacity of 1165 tons replaces two 7½-ton bridges at Carrie blast furnaces 6 and 7, U. S. Steel Co., Homestead. Dravo Corp. put up the structure, American Bridge Co., the main span.



## SULFUR: Controls Coming Soon

**Restriction deferment only temporary . . . Plan inventory orders . . . Output not meeting use . . . Would put quotas on plant basis . . . Could be serious for steel—By A. K. Rannells.**

Control orders limiting uses of sulfur and sulfuric acid have been postponed—but not for long. Inventory ceilings are expected this week.

Decision to defer the order, originally set for Nov. 1, came after several discussions with industry advisory committees. Members asked for more time to study the proposed limitations before making recommendations.

**Controls Needed**—Defense Production Administration says that at the present rate (100 pct of 1950 use), sulfur production is not keeping up with consumption—and that restrictions must be imposed.

Native sulfur production for 1951 is estimated by DPA at about 5,252,000 tons. This is an increase of no more than 60,000 tons over 1950—about 10 pct short of filed requirements.

Total sulfuric acid production is estimated by DPA to amount to about 14,497,000 tons—about 375,000 tons above 1950. Requirements for 1951 are estimated at 14,464,000 tons, leaving a surplus of 33,000 tons—if the estimates click.

**Plant Basis**—Under the inventory order scheduled for this week, a 25-day ceiling would be imposed. Company use of captive sulfur would be restricted to 50 pct of the company's allocation, and enforcement of inventory restrictions would be on a plant basis rather than company-wide.

Industry advisory committees have objected to all three proposed provisions. NPA says it may compromise somewhat to permit a company to shift sulfur from plant to plant, provided it first notified NPA.

**Chain Reaction**—Effect on the steel industry is of special con-

cern. Steel is one of the largest single consumers of sulfuric acid—using, according to Bureau of Mines, well over 500,000 tons annually.

As proposed, the orders would have a chain reaction effect. Users of sulfur would be restricted to 90 pct of their 1950 consumption. Each plant using sulfuric acid would, in turn, be restricted to 90 pct of 1950 usage.

Adjustments would be made for plants which supply acid to the steel industry and certain other types of manufacture. This would mean that other consumers would actually get less than 90 pct.

**Save It**—Committee members agreed that a company should be permitted to use all captive sul-



**TV STAMPER:** This 900-ton Bliss press is helping to meet the demand for television tubes. Recently installed at Radio Corporation of America's Victor Div., Camden, N. J., the press stamps out the TV tube cones shown above.

fur recovered through its own equipment.

Early this week it did not seem likely that NPA would yield on this point. But the agency said it would include a provision to encourage development of facilities for such recovery as well as finding new sources.

### Kill 10 pct Steel Reserve Clause

Bowing to the opinion of the steel industry, the 10 pct reserve provision of National Production Authority order M-1 has been cancelled. Producers now may accept up to 100 pct of their capacity in CMP orders.

At the same time, revision of the order requires that NPA must be promptly notified of rejections and acceptances of ACM steel orders. Plants must also open their order books not later than 45 days prior to the lead time of various products.

**First Change**—This is the first of several changes which Defense Production Authority Chief Manly Fleischmann has under study for the improvement of steel distribution. It is detailed in Dir. 3, M-1, as amended.

It will permit suppliers to accept orders now for all of their February and March production. Producers are required to act on orders under the change not later than 13 days after they are received.

### Industry Controls This Week:

#### NPA Orders

M-1, Dir. 3, Amend.—Cancels 10 pct steel reserve clause.

M-88—Authorizes replacement of warehouse stocks of wrought aluminum products shipped out on CMP orders.

### Appointed NSRB Official

Edward T. Dickinson, former U. S. Steel Corp. official, has been nominated vice-chairman of National Security Resources Board. Prior to his appointment, he directed the Air Force base-construction program.

## Automakers Quota Basis Studied

Changes in the percentage-of-industry ratings of automobile manufacturers by which National Production Authority allocates controlled materials are likely to be made following individual and collective meetings with members of the industry. These changes will become effective for second quarter, 1952.

No marked changes in individual percentages will be made in the proposed revision of ratings, NPA says. Some adjustments must be made to allow for new products which are not now reflected in allotments.

Not Liked—This is generally taken to mean that manufacturers who have come out with smaller model cars over the past year would benefit by the change. At any rate, the majority of the industry committee opposes the pending changes although far from happy about the present method of setting up quota percentages.

First quarter allocations for passenger cars were to be issued this week. They are to be on the basis of 930,000 units production for the quarter.

However, automakers are permitted to make as many as 1,000,000 units, provided the materials can be obtained from conservation, substitution, or absorption of inventories.

## Replace Wrought Aluminum Stock

New National Production Authority order, M-88, was issued last week to provide for replacement of warehouse stocks of aluminum wrought products which have been shipped out on authorized controlled materials orders.

For purposes of the order, aluminum wrought products are defined as including rolled bar, rod, wire and structural shapes; extruded rod, bar, shapes and tubing; sheet, plate, and foil; and pig or ingot, granular or shot.

Under the order, the distributor may place orders with a producer

# Here's how Wyandotte solved these 3 Defense Production Problems

## Case History No. 1

At plant A, specifications called for a neutral emulsion cleaner on 90 mm. shells prior to phosphating. After trying several emulsions, unsuccessfully, this plant installed EMLON, Wyandotte's stable solvent emulsion product. Because of EMLON's high detergency, stability and excellent rinsability, the results were outstanding, and the metal shells were in perfect condition for phosphate coating.

## Case History No. 2

At plant B, an Air Force subcontract for small aluminum parts prior to anodizing called for high detergency in an inhibited alkaline cleaner, with no attack permitted. After a series of tests involving competitive products, Wyandotte ALTREX was selected.

## Case History No. 3

An ordnance contract specified shell liner made of copper and steel parts assembled by brazing. At plant C, an effective and flexible operation was needed that would remove flux and oxides after brazing. WYANDOTTE A.E. --the newly improved dry acid cleaner--was installed and the results have been excellent.

Wyandotte has a long record of case histories like these. Why not call your Wyandotte Representative and get the experience of Wyandotte's technical staff behind your problem?



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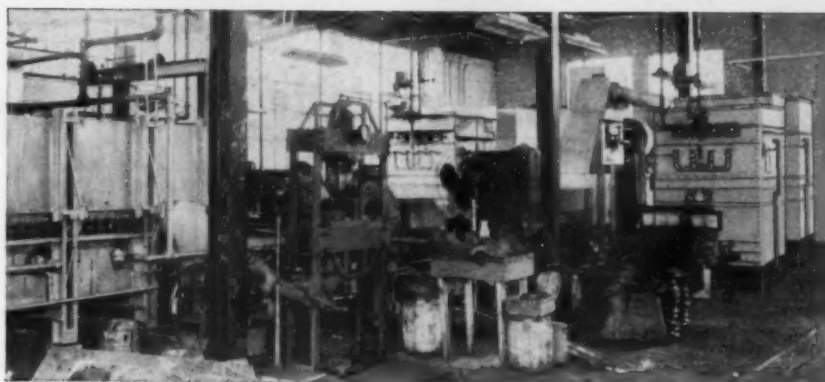
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November 8, 1951



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#### Controls

for replacement—after obtaining an A-M number in the 9000 series from NPA—of stock sold the previous month to fill ACM orders.

He may also replace, up to 10 pct of total sales from stock, un-rated orders from persons who have not been given NPA production schedules or allotments and not entitled to place ACM orders.

#### No General Order for Gas Users

Government aid in obtaining supplies of natural gas this winter for industrial users will be on an individual plant basis rather than on an industry-wide basis.

Petroleum Administration for Defense says it has given up as "unworkable" its earlier plans for drafting a general priority order for industrial consumers of natural gas.

Any industrial plant suffering from the gas shortage should apply to PAD for assistance. Agency says it will issue directives designed to cover individual cases.

#### Engineers to Get Pay Rise O.K.

Salary Stabilization Board has turned down the proposed exemption of engineers from its freeze orders. But board says it will write a formula designed to correct inequities and hardships in order to attract engineers to industry.

In addition to providing increases in engineers' salaries, SSB says it will also write new regulations providing additional pay for overtime work performed by engineers at the non-administrative and non-executive levels.

#### Broader Steel Drum Ban Studied

Broadening of National Production Authority Sched. 1 to M-75 (steel shipping drums), so as to prohibit more commodities and products from being packed in steel drums, may be in the offing.

At the insistence of the tight cooperation industry, control officials have agreed to review the existing schedule. The industry's advisory committee has pointed



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M orders

But, committee members say, if  
ore products could be shifted to  
common wooden barrels the indus-  
try could turn out another 2,500,-  
0 of this type container. It is  
estimated that such diversion  
ould result in savings of about  
0,000 tons of steel yearly.

### Users

obtaining this win...  
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stry-wide

Most important is proposal to  
mit machine tool production  
generally to defense-rated orders.  
National Production Adminis-  
tration officials say the proposed  
amendment, if adopted, will allow  
months for toolbuilders to com-  
plete any non-defense orders  
already in production.

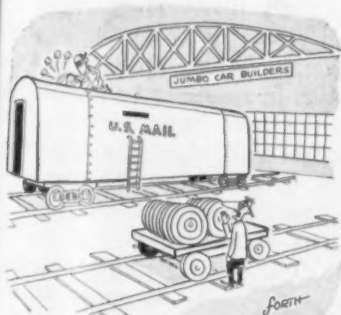
Reason for proposed amend-  
ments is that mobilization orders  
for tools and equipment are run-  
ning far ahead of delivery. De-  
fense Production Administration

estimates that machine tool out-  
put must be stepped up to 5 times  
the 1950 rate in order to take  
care of mobilization and related  
needs alone.

### Red Tape for Tractor Makers

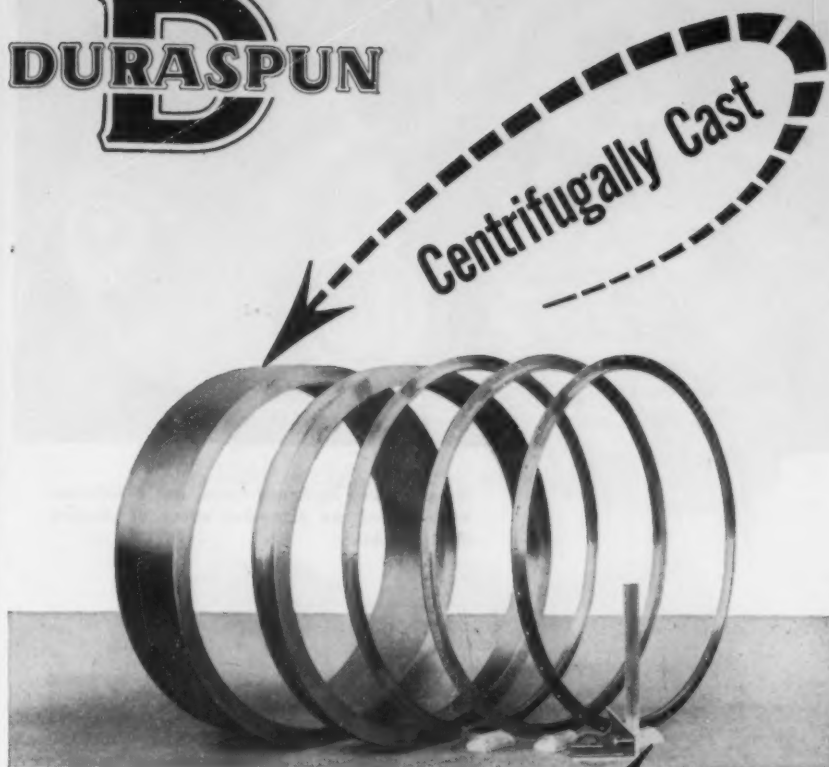
Greater mass of detailed infor-  
mation would be required from  
manufacturers of tractors and re-  
lated or allied equipment under a  
proposed revision of M-43.

National Production Authority  
says that in view of the growing  
demand and need for farm tractor  
equipment it may become neces-



"How's the new mail car coming, Ed?"

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proaches that imparted to a bar or ingot when it is hot  
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required of jet engine parts.

Incidentally, as evidence of our knowledge of and experi-  
ence with tough alloy castings — static as well as centrifu-  
gal — the records show very few rejections by this engine  
manufacturer who subjected each of the many rings we  
furnished to his own very rigid tests.

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**QUALITY**  
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**TOUGH**  
*Services*



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**Lebanon, Pennsylvania**

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**LEBANON** *Castings*  
ALLOY AND STEEL  


## Controls

sary to issue program quotas for scheduling allotments and production.

Under the proposed change, the order would require manufacturers to report production schedules by makes and models, bills of materials including use of controlled materials and components, and historical shipment patterns according to end use.

## Nickel, Cobalt Alloted by IMC

Largest fourth quarter allocations of nickel and cobalt will go to the U. S., United Kingdom, France, and Western Germany, by International Materials Conference agreement.

Total allocations for 33 free-world countries cover 31,153 metric tons of nickel and 2049 metric tons of cobalt, including oxides and salts.

U. S. will receive 19,690 tons of nickel and 1212 tons of cobalt. U. K. 5088 tons of nickel and 329 tons of cobalt.

France has been allocated 1461 tons of nickel and 75 tons of cobalt, while Western Germany will get 1425 tons of nickel and 127½ tons of cobalt. The other 29 areas will get smaller tonnages of each except Egypt, Pakistan, and Uruguay. They will receive no cobalt.

Both nickel and cobalt were heavily over-subscribed for the current quarter. IMC noted that when requisitions are compared to available tonnages, there is a 25,300-ton deficit of nickel and a 2000-ton deficit of cobalt.

## Sales Outside of OPS

Sales of cobalt oxide now will be made without regulation by Office of Price Stabilization.

Cobalt oxide joins cobalt ore and metal in occupying a price-exempt status. OPS expects its action in removing both the metallurgical and ceramic grades from control will eliminate any interference in the flow of the material to munitions producers.

The agency says all the crude cobalt alloy from which the metallurgical grade is made is imported, as is about 75 pct of the ceramic grade.

## Small Business Can Help Itself

"Help yourself to a defense contract" is more than a slogan. Small manufacturing establishments looking for defense business can do a lot of things that will greatly improve their chances of being selected as a subcontractor.

Based on Chrysler's experience with 9700 companies now supplying the corporation, J. Pfeiffer, director of purchases, offers the following suggestions and questions:

(1) Is your regular commercial production suitable, with minor adjustments to the defense effort?

(2) Analyze your equipment and processes to determine their adaptability to defense work.

(3) What do you want to make for defense? Who can use it? Defense agencies can usually furnish this information.

(4) Tell defense contractors what you can make for them and convince them that you can produce it on schedule, in the volume required and to the required specifications.

(5) If you receive an order, make sure to learn how your customer expects you to function. This includes tooling, supplying production samples, initial and subsequent deliveries, and the manner in which engineering changes are processed.

(6) Be prepared to tell customers all essential details of your business.

## Small Firms Take GE Jet Money

Other companies, many of them small businesses, took 60¢ of every dollar received by General Electric Co. from the Air Force for jet engines during the past year. The company said 4070 suppliers were involved in furnishing components, materials and services.

Figures were based on a 3-month survey of suppliers of GE's Aircraft Gas Turbine Dept. Of those replying, 82 pct are "small businesses," using the government's 500 employee dividing line between small and big business as a yardstick.

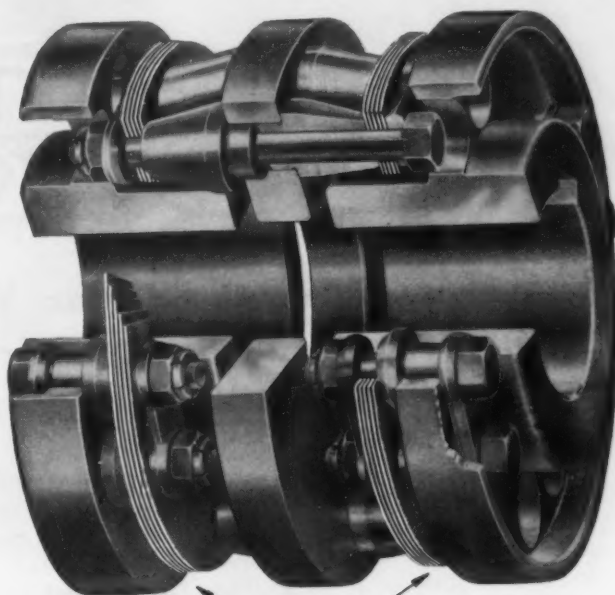
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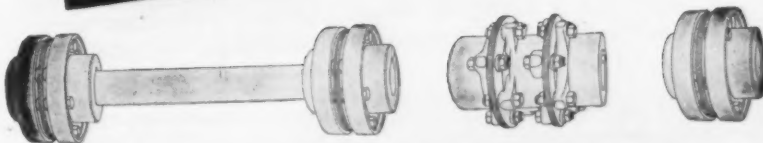
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FIRE WHISTLE  
BLOWS

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The know-how and experience of CARDOX fire authorities can be of incalculable value in your protection planning. A CARDOX survey puts it at your disposal—costs you nothing. Write for a CARDOX survey today—now.

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## Defense Contracts

### Contracts Reported Last Week

Circuit breaker—Rumsey Electric Co., Philadelphia.  
Connector, cable—James T. Heagarty & Co., Philadelphia.  
Lamp assy.—Guide Lamp Division, Anderson Ind.  
Road sweeper—International Diesel Electric Co., Long Island, N. Y.  
Pumping station—Harman Pump Co., Los Angeles.  
Air compressor—Joy Mfg. Co., San Francisco.  
Subgraders—Gar Wood Industries, Inc., Findlay, Ohio.  
Air compressor—Davey Compressor Co., Kent, Ohio.  
Repair parts—Woolridge Mfg. Co., Sunnyvale, Calif.  
Sweeper, road—Wayne Mfg. Co., Pomona, Calif.  
Graders—Austin-Western Co., Aurora, Ill.  
Spare items—Austin-Western Co., Aurora, Ill.  
Generator set—Buda Co., Harway, Ill.  
Generator set—Detroit Diesel Engine Div., General Motors Corp., Detroit.  
Replenishment of motor vehicle parts—Birmingham Motors Corp., Cincinnati.  
Replenishment of motor vehicle parts—Diamond T Motor Car Co., Chicago.  
Ohmmeters—Manhattan Lighting Equip. Co., Inc., New York.  
Ship's radio call alarms—Brelco Electronics Corp., New York.  
Drivers and wrenches—Chicago Pneumatic Tool Co., San Francisco.  
Circuit breaker—Bendix Radio Div., Bendix Aviation Corp., Baltimore.  
Heater, immersion—Sterling Mfg. Co., Omaha, Neb.  
Moving stairway equipment—Westinghouse Electric Corp., New York.  
Electric motors and controllers—Marathon Electric Mfg. Corp., Erie, Pa.  
Tool, ramming & extracting—American Swiss Mfg.  
Repair parts for motors—General Electric Co., Philadelphia.  
Repair parts for electrical control equipment—Penn Electric Switch Co., Goshen, Ind.  
Repair parts for gasoline engines—Chris-Craft Corp., Algonac, Mich.  
Repair parts for gyro compasses—Arma Corp., Brooklyn.  
Repair parts for diesel engines—The Maxine Silencer Co., Hartford.  
Valve Assemblies—Diamond Power Specialty Corp., Lancaster, Ohio.  
Repair parts for diesel engines—General Motors Corp., Cleveland.  
Repair parts for pumps—Carver Pump Co., Muscatine, Iowa.  
Repair parts for reduction gears—The Michigan Tool Co., Detroit.  
Repair parts for valves and control equipment—Atwood & Morrill Co., Salem, Mass.  
Test sets for electrical setting of torpedoes—Arma Corp., Brooklyn.  
Part for U. S. rifle—Haynes Stellite Div., Kokomo, Ind.  
Component part for U. S. rifle—Wood-Mosaic Corp., Louisville, Ky.  
Part for U. S. rifle—D. M. Rose & Co., Knoxville, Tenn.  
Spare parts—United Motor Service Div., General Motors Corp., Detroit.  
Spare parts—H. C. LeTourneau, Inc., Peoria, Ill.  
Spare parts—General Excavator Co., Marion, Ohio.  
Spare parts—Manitowoc Engrg. Wks., Manitowoc, Wis.  
Cover, tail—Rudy Mfg. Co., Dowagiac, Mich.  
Fuse, bomb, nose—Chicago Electric Mfg. Co., Chicago.  
Motor generators—Vickers, Inc., Vickers Electrical Div., St. Louis.  
Hull coolers—R. W. Fernstrum and Co., Menominee, Mich.  
Replenishment of tank parts—M-D Parts Mfg. Co., Los Angeles.  
Replenishment of motor vehicle parts—Ward LaFrance Truck Corp., Elmira, N. Y.  
Replenishment of motor vehicle parts—American Generator & Armature Co., Chicago.

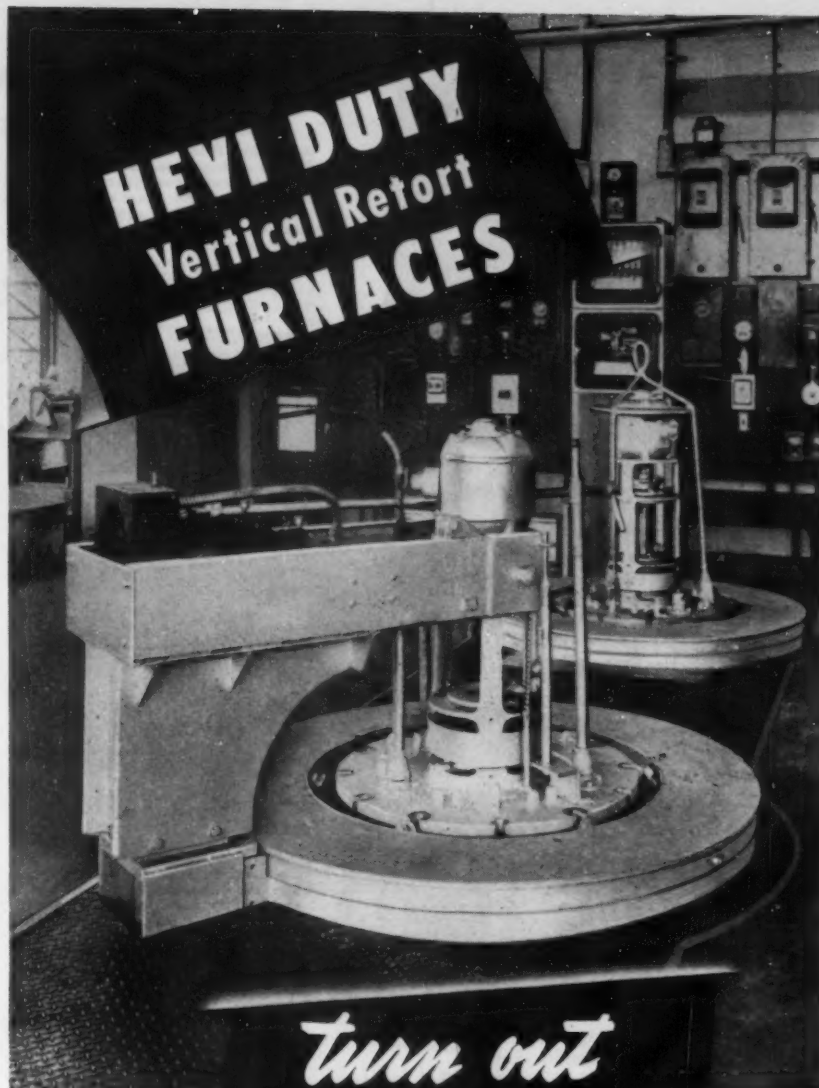
## Defense Contracts

al drilling machines—W. E. Shipley Machinery Co., Philadelphia.  
al Drills—W. E. Shipley Machinery Co., Philadelphia.  
ision surface grinders—Mattison Machine Wks., Rockford, Ill.  
achines, adjustable, open end—Plomb Tool Co., Los Angeles.  
e, Monarch—Machinery Associates, Inc., Philadelphia.

## Government Inviting Bids

Latest proposed Federal procurements, listed by item, quantity, invitation no. or proposal, and opening date. (Invitations for bids numbers are followed by "Q," requests for proposals or quotations by "Q.")

Spring, var, 10124-11-Q, Nov. 16.  
Transformer assy., var, 11365-17-P, Nov. 16.  
Mount vibration, var, 1142-26-B, Nov. 23.  
Connector, var, 1241-26-B, Nov. 16.  
Microphone, var, 10434-03-P, Nov. 16.  
Black tackle set, 4270 ea, 1141-26-B, Nov. 23.  
Transformer power, etc., var, 11359-17-P, Nov. 16.  
Hook base, etc., var, 10431-03-Q, Nov. 19.  
Studs, rods and holder, var, 1252-25-B, Nov. 14.  
Assy. coil and shield, 4965 ea, 11847-17-P, Nov. 14.  
Relays, var, 10310-20-P, Nov. 14.  
Key, etc., var, 10433-03-Q, Nov. 13.  
Meter, var, 10038-04-Q, Nov. 19.  
Gear assy., var, 10294-20-P, Nov. 14.  
Meter, etc., var, 10031-04-Q, Nov. 14.  
Terminal lug, var, 11010-29-Q, Nov. 14.  
Circuit breakers, var, 397-20-B, Nov. 14.  
Coil, etc., var, 10855-23-Q, Nov. 14.  
Relays, var, 10312-20-P, Nov. 14.  
Relay, 14300 ea, 10905-20-P, Nov. 14.  
Handle, etc., var, 10070-02-Q, Nov. 26.  
Misc. metal parts, var, 11396-29-P, Nov. 14.  
Brace, var, 1137-26-B, Nov. 14.  
Tools, specie, var, 47-12-B, Nov. 19.  
Wrench, var, 52-12-B, Nov. 26.  
Motor, var, 70-11-B, Nov. 19.  
Sleeve, var, 11012-29-Q, Nov. 19.  
"Q" crane crawler, 16 ea, (YDSO-84-52), Nov. 15.  
"B" boiler, steam, 1 ea, (YESO-84-52), Nov. 15.  
"H" generator sets, 12 ea, (YESO-48-52), Nov. 15.  
Rope, wire, 900,000 ft, (TC 04 197 52 12 B), Nov. 13.  
Wire, steel, 24,000 lb (TC 04 197 52 12 B), Nov. 13.  
Valve, semisteel, 420 ea, (23-065-52-285B), Nov. 13.  
Pipe, steel, seamless or welded, black, 1000 ft (ENG-23-065-52-293B), Nov. 14.  
Steel, alloy, 60,000 lbs, 29606 Q, Nov. 15.  
Oil, sub machine gun, 75,000 ea, (11-070-2302B), Nov. 23.  
Mat, airplane landing, 14,966 bds (DA-ENG-458-52-23B), Nov. 13.  
Bridge, floating, 11 (DA-ENG-36-058-52-7B), Nov. 12.  
Flot, half-pneumatic, 640 (DA-ENG-36-058-52-35B), Nov. 12.  
Radiator assy., 51,600, 52-630B, Nov. 23.  
Tubing, cap, seamless, 275,000, 52-477B, Nov. 23.  
Bearing, ball, comp. assy., 24,815, 52-474B, Nov. 23.  
Batteries, storage, 825 ea, 70B, Nov. 16.  
Reamers, steel, 3420, 5537-B, Nov. 26.  
Reamers, taper pin, 129 st, 5537-B, Nov. 26.  
Dish, metal, 427 ea, 52-4413-B, Nov. 5.  
Spare parts for stove, cooking, 100,000 ea, 52-458-B, Nov. 5.  
Commercial hardware, 50 itm, 52-265-B, Nov. 19.  
Nails, 53 itm, 52-5091-Q, Nov. 14.  
Commercial hardware, 11 itm, 52-5105-Q, Nov. 19.  
Hand operated lift pumps, 1300 ea (ECA-52-750-H204-2214-1), Nov. 19.  
Cylinders, brass lined, 1300 ea (ECA-59-52-H204-2214-1), Nov. 19.  
Steel pump or suction rod, 2000 lgth (ECA-52-740-H204-2214-1), Nov. 19.



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require a minimum  
of floor space*

New plant space is expensive. That is why the Hevi Duty vertical retort furnace should fit into your program of expansion of production heat treating facilities. It is economical—turning out tons of work in a minimum floor space, flexible—the same furnace can be used for most major heat treating operations such as Carburizing, Nitriding, Dry Cyaniding, Bright Annealing and Clean Hardening. Information which will interest you is in Bulletin HD-646—send for it—today

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Railmaster 3-ton crane serves the paint shop area and interlocks via track curve with crane serving the sand blast room. Interlocking track is equipped with opener to allow fire door closure.

Track and switches with spur tracks over welding booths for easy spotting of heavy loads in booths.



Compact track and crane system over the electrical shop area. Note hand chain drop section on extreme left, which lowers a hoist carrier for service or repair.



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In this, one of the country's largest maintenance shops, American MonoRail Overhead Handling Equipment serves the entire department. Included in the department are: machine shop, electrical repair, metalizing room, welding, painting and sand blast room, pipe shop, and inside and outside storage. This plant has shown a definite increase in efficiency and a great reduction in handling costs.

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## Construction

### Steel Inquiries and Awards

Fabricated Steel Awards this week include the following:

- 600 Tons, Van Buren County, Iowa, Bridge Project FN-737, to Bethlehem Steel Co.
- 400 Tons, Cascade County, Mont., Bridge Project 5-77/2, to Pittsburgh Bridge Moines Steel Co.
- 150 Tons, Calvert City, Ky., acetylene plant for National Carbide Corp., United Engineers & Constructors general contractors.
- 112 Tons, Colebrook and Lemington, N. H., reinforced concrete deck of steel stringer bridges, U. S. Route 102 to junction Vermont Route 102. Completion date Sept. 1, 1952. Daniel Transportation Co., Lebanon, N. H., is low bidder.
- 110 Tons, Chester, Pa., masts and king posts for Sun Shipbuilding & Drydock Corp., to Bethlehem Steel Corp., Bethlehem.

Fabricated Steel Inquiries this week include the following:

- 8700 Tons, Tobyhanna, Pa., warehouse and other buildings for U. S. Army Corps of Engineers, bidding extended to Nov. 8.
- 1000 Tons, Lexington, Ky., two warehouses for U. S. Army Signal Corps.
- 900 Tons, Mechanicsburg, Pa., storage tanks for U. S. Navy Depot, bids due Nov. 13.
- 800 Tons, Toledo, two warehouses for General Services Administration.
- 621 Tons, Boston, Mass., traffic interchange near the Longfellow Bridge, Charles River Reservation. Furnishing, fabricating and erecting steel work of the bridges forming traffic interchange near Boston end of the Longfellow Bridge; furnishing all materials and constructing concrete slab bridge floors, concrete curbs, bituminous concrete roadway surfaces, granite edgestone, etc. Completion date July 1, 1952.
- 450 Tons, Dauphin County, Pa., divided highway, 1 slab bridge, 1 I-beam bridge, Pennsylvania Department of Highways, Harrisburg, Pa. Bids to November 9, 1951.
- 350 Tons, Kingston, Pa., fabricated steel for Catholic Central High School, bids due Nov. 15.
- 280 Tons, Indiana County, Pa., highway project for Pennsylvania State Dept. of Highways, bids due Nov. 21.
- 240 Tons, McKean County, Pa., highway project for Pennsylvania State Dept. of Highways, bids due Nov. 21.
- 138 Tons, Clarion County, Pa., highway project for Pennsylvania State Dept. of Highways, bids due Nov. 21.
- 100 Tons, Kingston, Pa., joists for Catholic Central High School, bids due Nov. 15.

Reinforcing Bar Inquiries this week include the following:

- 1500 Tons, Dubuque, Ia., power plant.
- 1200 Tons, Allentown, Pa., Hot Strip Mill, Pittsburgh Steel Co.
- 760 Tons, Clairton, Pa., by-product coke plant.
- 465 Tons, Dauphin County, Pa., divided highway, 1 slab bridge, 1 I-beam bridge, Pennsylvania Department of Highways, Harrisburg, Pa., bids to November 9, 1951.
- 400 Tons, Niagara Falls, N. Y., International Graphite and Electrode Corp.
- 325 Tons, Dayton, propeller test stand, Wright Field.
- 235 Tons, Des Plaines, Ill., Main Township High School.
- 225 Tons, Hines, Ill., laundry building, Veterans Administration.
- 225 Tons, Neville Island, Pa., Bureau of Public Roads.
- 135 Tons, Wayne, Mich., Wayne Memorial School.



## This Week in Washington

### Push Catalog of Industry for Buying

**Justice Dept. seeks central procurement plan . . . To give government access to all producers . . . Will aid defense buying . . . Pass the buck on lead shortages—By G. H. Baker.**

New drive for establishment of a federal "central procurement plan" is being pushed by the Justice Dept.

Backers claim that government access to a complete catalog of all U. S. producers and manufacturers—large, medium, and small—will streamline mobilization buying.

To make the combined procurement program work, Attorney General McGrath says it is necessary for the government to know exactly who produces what.

**Preserved Intact**—As he puts it: "It is essential that we know the capabilities of businesses which constitute our existing and potential industrial capacity, so that we may take appropriate action to insure that those businesses not now engaged in defense production will continue undiminished in strength until they are needed in a period of greater industrial mobilization."

Small firms, he says, would be sought out because they "must be preserved as an essential asset in the event of total war."

**Cobalt Shorter**—Dock strikes have aggravated an already-serious situation in cobalt, NPA declared last week. Shipments of concentrates badly needed for the defense program are being held up.

The situation is squeezing the tool steel industry seriously, since about 90 pct of the cobalt supply is going directly into the defense program as the jet engine needs grow.

Meanwhile, tool steels will be

placed in a separate product classification from commercial alloy and carbon steels. This will be done under a revision of NPA Sched. 1 to CMP Reg. 1.

**Passing the Buck**—Sagging lead production is breeding a "who's-to-blame" ruckus between two mobilization agencies.

Defense Production Administration blames low price ceilings for the weak supply situation.

Office of Price Stabilization, however, says it will "resist strongly" any attempt to raise ceiling prices on lead.

**Proof in Imports**—DPA points out that U. S. consumers of lead imported about 45 pct of their total supplies in 1950. This year, im-

ports of lead ore and metal are expected to fall from the 1950 figure of 521,000 tons to about 250,000 tons.

Allocations of primary lead for gasoline and storage batteries for civilian use probably will have to be cut further, as a result, DPA estimates.

**Barter System**—Negotiations are being carried on quietly behind the scenes with England, looking to the exchange of some less-critical kind of American steel for British-made structurals.

This is on the basis of domestic structural shortages remaining "as bad as at present at least through first-half 1952." DPA Chief Fleischmann says that needs for the more important expansion programs will begin to ease off in late 1952—that a slightly "more liberal" program will be possible by 1953.

Meanwhile, the British are reported having shown a willingness to dicker.

**Navy Scrap Hunt**—Led by NPA's Salvage Chief, Edward W. Greb, Navy officials started out last week to take a good look at West Coast naval installations with a view to flushing out more scrap.

Trip will take about 2 weeks. Scheduled for inspection are air stations, shipyards, supply depots, and other Navy properties located at San Diego, San Francisco, Oakland, Seattle, Salt Lake City, and other cities.

In addition to Greb, the party will include Comdr. G. S. Heffner, chief of Navy's property disposal branch; David W. Tompkins, Office of Naval Materials; Paul Somerville, Navy Bureau of Supplies and Accounts, and Peter Black, special assistant to Defense Production Chief Manly Fleischmann.

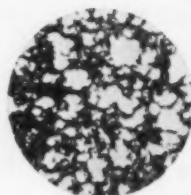
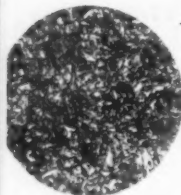
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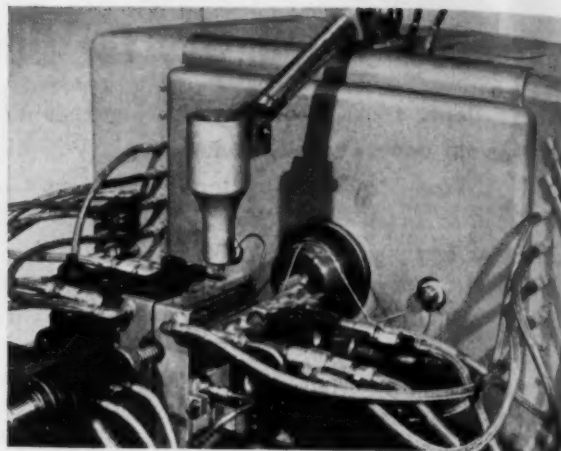
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Material: SAE 1050  
Structure at surface: Rc 53-55



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# MONOPOLY: Defense No Excuse

Washington warns that mobilization frenzy is no excuse for bypassing antitrust laws . . . Federal agencies should be on the alert . . . Group advocates uniform policy in exemptions.

Mobilization planners this week studied a new "watch-your-step" warning from Capitol Hill: Programming for high-speed defense production does not justify any bypassing of the antitrust laws.

Ability to ferret out and to block any business conspiracies that smack of monopoly is the job of every federal production-planning agency, the House Monopoly subcommittee says in a new report.

The fresh Congressional warning against collusion among producers, fabricators, and manufacturers is pitched to this ominous theme: "The road to a cartelized or concentrated economy may be paved with good intentions."

**Taking It Easy?**—The subcommittee says "ignorance and confusion" among defense officials over antitrust policy is "endangering free competition." Preoccupation with rearmament, coupled with an inclination to minimize economic hardships for industry, is resulting in a take-it-easy policy toward rigid enforcement of the antitrust laws, it adds.

Defense agencies should follow a uniform policy in obtaining exemptions from the antitrust laws for voluntary industry agreements which contribute to national defense, the subcommittee states. It adds, however, that such agreements should be kept to a minimum.

## NW. Steam Plants Gain Backing

Construction of government-financed steam generating plants in the Pacific Northwest has gained the backing of Defense Mobilizer Charles E. Wilson.

Noting the "substantial cut-backs" in West Coast aluminum production recently because of severe droughts, Wilson now calls

for Congressional approval of bills authorizing steam plants as a means of weaning Northwest industry away from over-dependence upon hydro-electric power.

**Integral Part**—Wilson favors incorporation of steam-generated power into the Northwest's power grid on a permanent basis. "I do not believe that we should commit the materials at this time for construction of power plants if they are to be used only for standby purposes," he states, adding that "they should be regarded as a regular working part of the power grid in that area."

**Add to Supply**—If the proposed steam plants are in operation by the end of 1954 they would help to relieve the shortage predicted for then, he believes. In future years, he says, the steamplants would provide a source of power complementary to the hydro in Northwest systems, and whose output would be within a reason-

able reserve ratio for the area, provided that all other projects now planned go ahead as scheduled.

Legislation requested by Wilson carries with it only Congressional approval of the projected plants. Actual funds would have to be appropriated at a later date.

## Defense Spending Climbs

Government purchases of strategic materials for stockpiles will total about \$800,000,000 between now and July 1, 1952. Authority for the huge buying program is contained in a \$1,676,246,976 appropriation bill signed into law by President Truman last week.

Another record money bill (\$4,176,707,108) approved at the White House last week authorizes Army, Navy and Air Force to speed up their programs of new and expanded military bases throughout the world.

About \$1,000,000,000 is earmarked for a ring of air fields within easy range of Russia. Locations are not disclosed. In addition, Air Force is authorized to build tighter interceptor wings near large U. S. industrial centers.

## Less Metal for Lamps Next Year

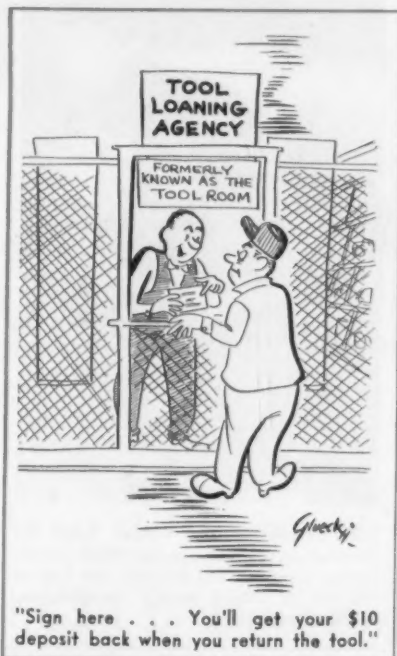
Manufacturers of floor and table lamps face the prospect of having to turn to plastic and other nonmetal materials next year.

The incandescent and fluorescent portable lamp industry has already been warned by NPA that, while a little increase in steel might be allowed for first quarter 1952, there will be cuts in allotments of copper and aluminum.

Pending actual allocation sometime this week, it was indicated that percentages for the first quarter, in relation to fourth quarter levels, would be reduced roughly as follows:

Brass mill copper, from 45 to 10 pct; wire mill copper, from 60 to 35 pct; foundry copper, from 60 to 35 pct, and aluminum, from 35 to 10 pct.

Users would be given a base period choice.





# Industrial Briefs

**Improvement Planned**—NEW YORK CENTRAL RAILROAD will improve its Ashtabula Harbor docks this winter to speed the unloading of ore from the new, deeper and larger Great Lakes vessels. Hulett ore unloaders at the docks will be improved by the installation of gooseneck-type equalizers.

**Defense Purposes**—AMERICAN RADIATOR & STANDARD SANITARY CORP. will produce magnesium castings for defense purposes, at its North side, Pittsburgh, plant, beginning early next year. The company is producing defense castings at Litchfield, Ill.

**Corporation Created**—Sante Fe Railway has formed a new corporation known as HAYSTACK MOUNTAIN DEVELOPMENT CO., to mine uranium ore recently discovered on company property near Grants, N. M.

**Outstanding Service**—For outstanding service to the company, four ALLEGHENY LUDLUM STEEL CORP. employees have received the president's medal and \$1000 in cash. They are Schuyler A. Herres, Douglas S. Gormley, I. G. Shoff and John Eagleson.

**Buys Factory**—NATIONAL ELECTRIC PRODUCTS CORP. has purchased a factory in Elizabeth, N. J. It will start immediately to equip the plant with more than \$2 million worth of machinery for the manufacture of electrical roughing-in materials.

**Debt Reduced**—SOSS MFG. CO., Detroit, has further reduced its corporate debt by the payment of \$67,000 on its loan from the Prudential Insurance Co. of America.

**Consolidation Planned**—Food Machinery & Chemical Corp. plans to consolidate the activities of the Anderson-Barngrover Div. and the Sprague-Sells Div. into one operation known as the CANNING MACHINERY DIV., effective Jan. 1.

**Acquisition**—AUTOMATIC STEEL PRODUCTS, INC. recently acquired the Metroloy Corp. of New Rochelle, N. Y.

**Wins Flag**—With 98.7 pct of its 27,000 employees buying defense bonds, U. S. Steel's NATIONAL TUBE CO. has received the first U. S. Treasury Dept. Flag for outstanding bond sales, which is an all-time high for large industrial plants.

**Distributors Appointed**—RIGIDIZED METALS CORP. has appointed Hill-Chase & Co., Inc., Philadelphia, and the Hill-Chase Steel Co., Baltimore, as their distributors in Pennsylvania and Maryland.

**Permanent Possession**—By winning the Trailmobile Trophy three times in succession, PACIFIC INTERMOUNTAIN EXPRESS, INC., Oakland, Calif., became its permanent owner. The award is presented annually by the American Trucking Assn. for safety and service on the highways.

**General Distributors**—Tinnerman Products, Inc., has appointed NEW YORK BRASS & COPPER CO., INC., as general distributors of standard, Flat-type SPEED NUTS in the metropolitan area of New York.



**ICE DAMAGE:** Arc welder holds his balance on scaffold over ice-filled waters. Large chunk of ice cracked the hull of this U. S. Navy vessel, necessitating welding repairs.

**Yale Rep.**—Baker Equipment Engineering Co. were appointed representatives for YALE & TOWNE MFG. CO., Philadelphia Div., to handle their line of materials handling machinery in Charleston, W. Va., marketing area.

**Going Up**—STONHARD CO. will erect a one-story building to house the company's offices, warehousing and manufacturing facilities. The site is part of the old Phillies Ball Park, at the northwest corner of Broad and Huntingdon Streets, Philadelphia.

**Commendation**—ACME STEEL CO.'s Hoffert Machine Div., Racine, Wis., won a first prize award at the National Safety Congress, with a perfect safety record for the second consecutive year. Award was won in Group C, Light Machinery Div., Metal section, for no lost time accidents from July 1, 1950, to June 30, 1951.

**Rebuilds Blast Furnace**—GLOBE IRON CO.'s blast furnace which was down for improvements is back in production. It has been relined, enlarged. A new secondary dustcatcher, new uptakes were added.

**Branch Office**—The new sales branch office of RELIANCE ELECTRIC & ENGINEERING CO. is located at 2144 Madison Ave., Toledo, and is headed by John Drollinger, Jr.

**Construction Started**—Construction has started on a \$2,500,000 addition to the WESTERN AUTOMATIC MACHINE SCREW CO. plant, in Elyria, Ohio, by the H. K. Ferguson Co.

**French Visitors**—A group of 16 Frenchmen, representatives of employers, unions and the French government's ministries of labor and national defense, visited INLAND STEEL CO.'s Indiana Harbor Works, East Chicago. The group is spending 3 months in the United States, sponsored by the Economic Cooperation Administration on a study program arranged by the U. S. Dept. of Labor.

**District Office**—SHELL CHEMICAL CORP. has opened a new sales office in Atlanta. M. W. Ellison has been manager of the new sales district.

# EFFECTIVE PENSIONS

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**MANAGEMENT and LABOR**



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## The Automotive Assembly Line

### Tax Hike Makes Cars Harder to Sell

**Costs of raw materials are rising . . . Expect steel price increase . . . Earnings off . . . Conversion steel may be cheaper . . . Copper to be regulator of production—By W. G. Patton.**

The federal excise tax hike of 10 pct effective last week offers little consolation to automakers. The latest tax boost will make cars harder to sell. Meanwhile, the cost of raw materials is going up. Steel prices will probably be increased early next year. Tooling is more expensive. Inflation carries automotive wages constantly higher. Auto earnings are off sharply.

The only relief for automobile accountants in recent months has come from a small reduction in tire prices and a decrease in the cost of conversion steel. Conversion steel ingots could be bought in Detroit last week for less than \$70 per ton. With their volume off sharply, the percentage of conversion steel to total steel is being reduced substantially.

**Conversion Downtrend** — The first quarter of next year will see a race between the rising cost of

practically everything else and an appreciable reduction in the cost of that portion of steel obtained by the conversion route.

While future events may change the course of steel demand, the present trend indicates that conversion steel will be a relatively unimportant factor in automobile production commencing about the second quarter. The amount of conversion steel to be used during the first quarter of 1952 has been cut sharply compared with the final quarter of 1951.

**Output Regulator** — Copper rather than steel will call the turn of automobile production during 1952. As the copper supply situation has deteriorated, pressure on steel has been noticeably reduced.

Car makers are actively at work on substitutes for copper. Last week Packard announced it has eliminated 12 lb of copper out of 55 lb normally required for a car.

The use of steel fins rather than copper fins on a radiator saves a considerable amount of copper. Gages have been reduced.

Like other producers, Packard is experimenting hopefully with aluminum for radiators.

**Danger Point**—Many auto experts now believe passenger car production will settle at a level of about 1 million passenger cars per quarter. Adding one-fourth as many trucks, the vehicle total adds up to 5 million units per year. Many Detroit executives feel it would be dangerous, in the absence of all-out war, to cut civilian automobile production much below this level.

In addition to mass layoffs of workers in auto plants, it is pointed out that 40,000 auto dealers employing 10 to 30 persons will also be seriously affected by production cutbacks. LeRoy Spencer, Packard executive vice-president, emphasized this point at last week's press conference.

**Shift to Defense**—Packard's situation is typical of progress up to this time of defense work in Detroit auto plants. At the moment, Packard has initial contracts aggregating \$300 million. These include jet engines, Navy and Air Force contracts. Employment is currently about 11,000 workers.

The employment total may be doubled by the end of 1952 if work goes forward on schedule and the present contracts are increased as is now anticipated. At the moment, Packard is producing a few parts for defense.

**Need is Small**—A month or two ago there was wild speculation in Detroit about the future of stainless steel trim. Fears were expressed that practically all decorative molding would be banned. Engineers were talking about die



**SUPER SUPER:** At wheel of Buick's convertible of the future, the XP-300, is C. E. Wilson, General Motors president. Seated beside him is Mrs. Wilson. Standing is Charles A. Chayne, GM vice-president in charge of engineering. Car was shown at GM proving ground and shipped to West Coast for public display.



changes and other steps that would have to be taken if decorative trim were removed.

An order to take this drastic step never came out of Washington. It developed that the military need for chromium was actually quite small. In addition, such an order would have put several small steel companies temporarily out of business.

### Savings Notes on Gas Turbine

A gas turbine installed in a heavy-duty truck by Boeing Airplane Co. has averaged a little better than 1 mile per gal of Diesel fuel. This compares with 3 to 5 miles per gal for conventional truck engines handling the same load. These facts were reported to the SAE by Henry C. Hill, assistant chief engineer of Boeing's Gas Turbine Div.

The Boeing gas turbine is about one-third the size of conventional truck engines. It develops 175 hp and weighs only 200 lb. The engine has now been tested more than 550 hr in a Kenworth truck.

### B-W Strike Casts Shadow

Shutdowns at ten Borg-Warner plants continue to pose a serious threat to future automobile production.

Auto producers have removed their tools and dies from the struck plants. Tremendous efforts are being made to line up other sources of supply. Deliveries from Borg-Warner's Muncie plant are threatened by its dependence on other B-W divisions.

### More Auto Plant Layoffs

Model changes and reduced production schedules will result in substantial layoffs in Detroit auto plants during the next few months.

Last week Ford announced about 30,000 of its workers at the Rouge plant will be off for part or all of the first 2 weeks in December. Another 15,000 Ford workers at the assembly plant are due for similar layoffs.

### Propellers:

**Dodge plant at San Leandro to make Hamilton Standard plane propellers.**

Chrysler will build Hamilton Standard propellers under an engineering assistance and license agreement with the Hamilton Standard Div. of United Aircraft Corp.

Work will be carried out at the Dodge plant at San Leandro in the San Francisco Bay area. Propeller production will not interfere with automotive output, Chrysler officials say.

More than 1,000 individual parts are used in the Hamilton propeller which weighs 175 lb and measures 16½ feet from tip to tin. There are four hollow steel blades.

All major parts will be produced at the San Leandro plant. Two horizontal 400-ton presses will be used to hot form the cores and shells of the large propeller blades.

The propeller operation will ultimately employ 4000 persons. More than 1300 machine tools will be needed.

### Features of Buick Engine

The experimental engine used in Buick XP 300 is special in many respects. However, many of its details will probably find their way into production engines.

The new engine has a "square" stroke-bore ratio (3¼ in.). The aluminum alloy cylinder head has a fully-machined, hemispherical combustion chamber. High-domed pistons are used.

The cylinder block and crank case are made of cast aluminum alloy. Wet cylinder sleeves are cast from Ni-Resist iron having a coefficient of expansion that approximates that of the aluminum alloy. Overhead valves have an included angle of 90°.

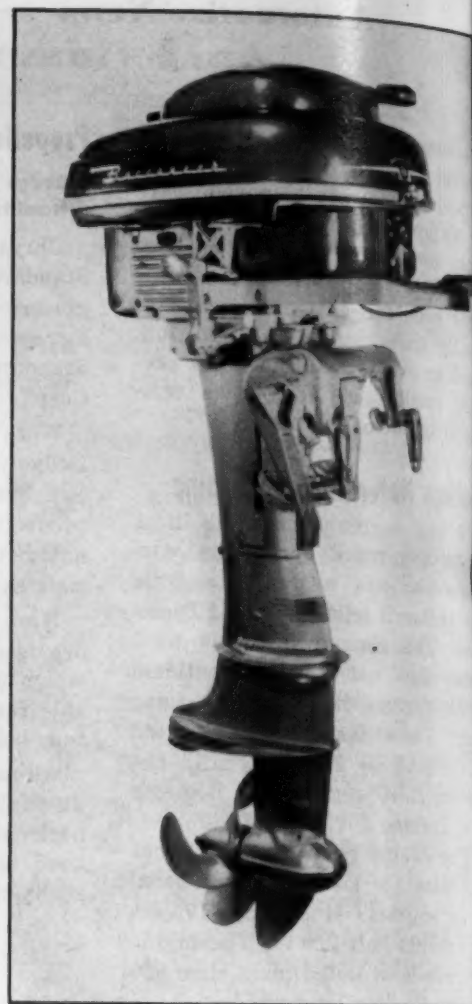
### THE BULL OF THE WOODS

By J. R. Williams





Gale Products gas tank being assembled for furnace brazing.



## IMPROVE YOUR PRODUCT, CUT TIME-COSTS WITH ALUMINUM!

Gas tanks on Buccaneer outboard motors manufactured by Gale Products of Galesburg, Illinois, are not only lighter, hand-somer, more durable—they are easier, less costly to build, thanks to aluminum!

These all-aluminum tanks are about *one-third lighter than steel*—with the strength for rugged, outdoor use!

They are more durable, for aluminum is more *corrosion-resistant than steel*—a “natural” where petroleum products are used!

Aluminum tanks cost less to fabricate because aluminum is *more formable*—inex-

pensive to handle compared to steel!

By employing a *mass brazing technique* not feasible with steel, Gale eliminates expensive hand welding methods, lowers finishing costs. And brazing gives a more attractive appearance at the joints.

Let a Kaiser Aluminum engineer help you determine if aluminum is the answer to your design or production problems. No obligation or cost for his services. Kaiser Aluminum & Chemical Sales, Inc., Oakland 12, California. 65 sales offices and warehouse distributors in principal cities.

# Kaiser Aluminum

Setting the pace—through quality and service

## West Coast Report

### Defense Production at Faster Pace

**Aircraft output rising . . . Auto assembly feels shortages . . . Tungsten stocks grow . . . Fabricators hit quota delay . . . Smog controls hurt . . . Coke supply looks easier—By R. T. Reinhardt.**

It begins to look as though western industry is at last beginning to feel the impact of defense production.

In southern California aircraft production has been dawdling along waiting for completion of engineering, tooling and plant expansion. As one executive put it, "We've been spending too much time rolling up our sleeves."

Coincident with settlement of the strike at Douglas, there has been a marked up-beat in the tempo of production. Unit figures are kept in the "confidential" drawer, but there is ample evidence that planes are rolling off assembly lines at a rate approaching production goals. By the first of the year at latest, sleeves should be all the way to the shoulders.

**Auto Assembly Hit**—Shortages of materials have hit California auto assembly plants slightly harder than elsewhere, according to the sparse figures available.

A check of Ford, General Motors and Chrysler indicate that they are producing only about 60 to 65 pct as many units per day as they did 6 months ago. Change-overs to 1952 models get little blame for the reduction.

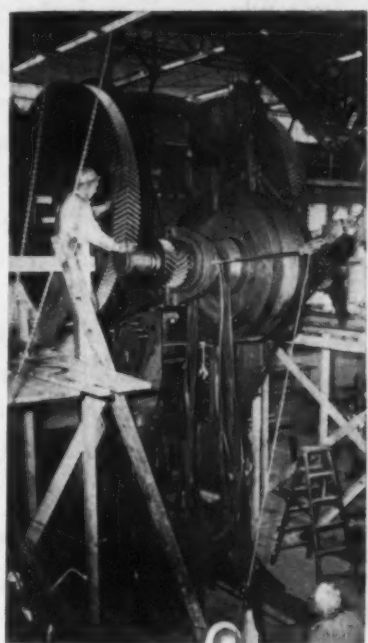
Only West Coast auto assembly plant which is known to be considering defense work in favor of auto assembly is the El Segunda, Calif., plant of Nash. Company produced propellers during the last war and could well handle jet engine assembly today.

**Infanticide**—Cut-backs in auto assembly have had their effect on

the infant parts-supply business in the West. Just as this growing business was getting into its stride, contracts were shaved. However, there have been no serious repercussions so far.

L. A. Young Spring and Wire Co. of Los Angeles has been forced to drop a contract for chrome-plating of bumpers because of a lack of chrome. An eastern plating company picked it up.

**Tungsten**—American Alloy Metals Co., headed by E. A. Julian, president of Goldfield Consoli-



**BIG PRESS:** This 1000-ton impact extrusion punchpress, one of the largest in the aviation industry, will soon go into operation at Lockheed Aviation Corp.'s Burbank, Calif., plant. Built for Lockheed by E. W. Bliss Co., Toledo, it is indicative of the trend toward heavier machinery for the aircraft industry.

dated Mines Co., San Francisco, has had to suspend test drilling operations on a promising scheelite deposit in Montana because of storms.

Frank Eichelberger, of a Spokane engineering firm, has estimated there is enough of the tungsten-bearing ore in the deposit to operate a 2000-ton mill 5 years. This would be the largest in the country.

**Fabricators' Lament**—Western steel fabricators feel they are getting a rough break in receiving notice of their quotas from Washington.

Complaints are based on the fact that these reports are mailed from the East to all applicants and those nearest Washington are first to be informed and have a 5-day jump on westerners. Eastern fabricators can get their orders into near-by mills well ahead of westerners who then may find their orders carried over to the next quarter.

**It Can Hurt**—Opponents of the stringent smog control regulations of Los Angeles County are pointing to the auction to be held Nov. 12 and 13 of the building and equipment of the Eljer Mfg. Co. as an example of what can happen.

Eljer ceased making bathroom fixtures 18 months ago with announcement that it could not afford the \$100,000 investment in smog control equipment they would need to comply with regulations.

**Good Foundry News**—Coke may once again be easy on the Coast.

Although Columbia Steel Co., sales agent for Geneva Steel Co., hasn't reported it, there may be more foundry coke available as the result of completing rebuilding of the 23 ovens at the Iron-ton, Utah, plant.



# EVEN OUR COMPETITORS' BEST CUSTOMERS INSIST ON SUNOCO WAY LUBRICANT

In the competition for industry's lubrication business, all refiners are constantly improving their products. Every so often, one company or another finds a way to make a petroleum product that, for a particular use, licks to a standstill anything its competitors can offer. Immediately the others dig in and try to find the secret. Until they succeed, the originator's ingenuity pays off in a rising flood of sales.

That is the happy position in which Sun Oil Company finds itself with its Sunoco Way Lubricant. Since its introduction eight years ago, no other refiner has been able to match this tableway lubricant. Here is proof any man in metalworking can appreciate:

Sunoco Way Lubricant is insisted upon by 188 metalworking concerns which buy all their other lubricants from our competitors.

In other words, our competitors have loyal 100% customers, just as we have; but when it comes to tableway lubrication, loyalty goes out the window and Sunoco Way Lubricant is specified.

The reason for the success of Sunoco Way Lubricant is that no one has been able to equal it for *protection of tableways . . . ability to prevent "stick-slip" . . . prevention of table flotation . . . resistance to wiping off or squeezing out under heavy loads*. These benefits add up to higher production, better finishes, lower maintenance costs, longer tool and machine life. That is why Sunoco Way Lubricant is approved or definitely recommended by 38 of America's leading machine tool builders.

Want to see factual case histories and learn more about this product? Send for illustrated booklet, "Sunoco Way Lubricant." Samples are available, too, to companies in the metalworking industry. Write Dept. IA-11.

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## Machine Tool High Spots

### Reds Worse Off than U. S. on Tools

Russia can't make all machine tools it needs within its borders

... War ruined many plants ... Parts are problem ...

Washington to restrict non-rated production—By G. Elwers.

As Americans watch defense production lag because of machine tool shortages, it may help little to know Russia is in the same fix—but worse. Their 5-year plans have not gotten rid of the scarcity.

A survey of the Russian production tool situation as we know it was recently given the American Ordnance Assn. by Comdr. W. T. Greenhalgh. The Soviet government has been in dire need of machine tools since its inception, Comdr. Greenhalgh said.

**Still Shackled**—Though Russia has always tried to manufacture everything it needed within its own borders, or at least within its satellite's borders, there is plenty of evidence she has not succeeded in becoming independent of western machine tools.

This is shown by the loudness and bitterness of Russian attacks on the West for the embargo on shipments of machine tools. And it is shown by attacks in the Russian press on its own and satellite nation machine tool plants for not producing more.

**Grandiose Claims** — Russians are notoriously poor mechanics and machinists. And they had some 780 machine tool plants destroyed by the Germans in the last war. Still, they claim to have produced 105,000 machine tools in 1948 and to have exceeded the machine tool goals of their fourth 5-year plan.

They say they are going to double their 1940 output of tools during the next 5-year period.

**Spare Parts** — Still, Russia needs, and actively seeks, Western machine tools. For those which it already has purchased, there is a severe shortage of spare parts. Lack of spare parts has forced many Russian industries into the position of discarding foreign-made production equipment as impractical.

A particularly sore spot in Russia has been the production of new machine tool designs. As in the U. S., it has been found that new types of weapons need new tools. Some Russian factories may be meeting their quotas of standard tools, but design and production of new types and specialized machines lags seriously.



**Added Strength**—Besides drawing on domestic production, Russian defense plants have acquired many machine tools taken as reparations or just plain stolen from Manchuria and Germany.

In addition, the Reds have dismantled and moved to Russia some machine tool plants from the Soviet Zone of Germany. And, of course, most of the machine tool production of satellite countries goes to Russia. East Germany, Czechoslovakia, and Hungary are the chief contributors.

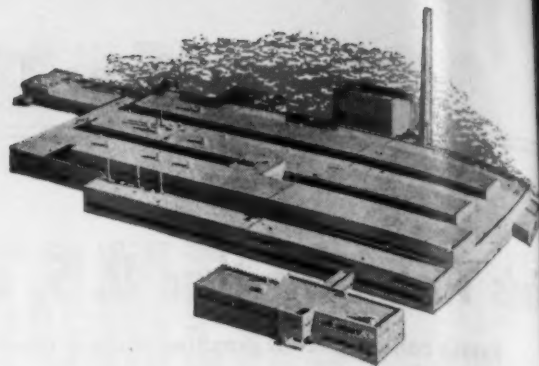
The shortage of skilled workers in Russia is far more severe than in this country, Comdr. Greenhalgh asserted. In addition, management and supervision is very poor. Material shortages, too, are far more hampering than here.

**More for Defense**—An order will shortly be announced in Washington changing the present allocation of machine tool output. Its purpose will be to further restrict output of non-rated machine tools and thus gain more capacity for defense.

In most machine tool plants a very high percentage of work is in machines going directly into defense work. But in some shops, particularly those which specialize in building for automakers, 10 to 15 pct of work is still non-rated.

**New Orders Dip**—Preliminary figures from the National Machine Tool Builders' Assn. shows the new order index dropped sharply in September, to 380.2 from 488.9 in August. The foreign order index dropped to one-half of its August level. The shipment index rose from 178.9 to 189.8 in September.

But even at these levels machine tools are still being ordered twice as fast as they are being built. The backlog stands at almost 24 months.



N-B-M Meadville . . . where the welcome mat is out. We're proud of this plant—its equipment and the skilled people who work in it. Proud enough, in fact, to offer a standing invitation to Blast Furnace Superintendents or other steel mill officials to visit us. When can you make an inspection trip?

## Finished . . . with a finished touch



Here's where you'll find complete facilities for supplying copper castings with any finish specified.

*Another reason why N-B-M Meadville is a name to remember when you specify copper castings. The photos above—showing copper castings in the process of being finished—typify the equipment at N-B-M Meadville . . . complete equipment for efficient production of castings in any degree of finish.*

In these particular cases, all loose sand—both inside and out—is removed by hydroblasting,

rather than rely on simply turning the casting upside down. The machined butt on N-B-M Tuyeres results in a better finish, a better fit—and more important, *helps prove soundness of the casting.*

From the molding floor to the shipping room, N-B-M Meadville accomplishes what should be, and is, the main objective of this modern, well-manned plant . . . ***What you specify . . . we ship.***

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# *The* **Iron Age**

## **SALUTES**

*F. Kermit Donaldson*

Whole steel castings industry  
benefits from this foundryman-  
musician's time and experience.



“STEEL FOUNDRY BLUES” has nothing to do with current business conditions: it’s a real song by a talented musician. The composer is probably the only professional bassoon player in the steel industry, a first-desk man with the Canton, Ohio, Symphony Orchestra.

This kind of imagination and versatility are characteristic of F. Kermit Donaldson, executive vice-president of Steel Founders Society of America. A rare combination, he backs up his talents with 35 years of practical steel foundry experience. He has worked at all levels—from apprentice to vice-president and general manager of Machined Steel Castings Co.

Kermit has long been active in Steel Founders Society affairs: first as a national director, then as vice-president. He served as president in 1948.

The Society has recognized his services with its highest honor, the Lorenz Memorial Gold Medal. He was elected executive vice-president in 1949.

A tireless worker, he travels more than 50,000 miles yearly on Society business. He has served on many national advisory committees and is active in both business and civic affairs. All testify to his talent for organization.

Kermit lives in Alliance, complains his traveling makes it hard to keep up his music. His more serious music includes a piano concerto—strictly longhair. He can also keep an audience ga-ga with a really hep beat in boogie-woogie. He’s the father of three children, a daughter and two sons.

# ...Out of the Blue!



A design takes shape . . . fabricated steel moves out on time . . . accurate workmanship and close adherence to "specs" the keynote. • Columns and trusses for new plants, highly fabricated steel for conveyors and coke ovens, intricate chute and hopper work, turn-tables for rotary furnaces . . . all tailor-made to meet the rigid demands of today's defense mobilization program. • Accomplishing the unusual in the usual way is a matter of *routine* at Levinson's.



The **Levinson**  
**STEEL COMPANY**

20TH & WHARTON STS., PITTSBURGH 3, PA.

# *The Iron Age*

## INTRODUCES

Steve A. Firard, appointed vice-president in charge of operations of KAISER-FRAZER CORP., Willow Run, Mich.

L. L. Meikle, elected president of the LINCOLN ENGINEERING CO., of California.

Karl H. Meyer, returns to Cleveland as manager of the Ivanhoe Div. of the RELIANCE ELECTRIC & ENGINEERING CO. Walter H. Haber, succeeds Mr. Meyer as production manager at the Ashtabula plant.

John A. Rozos, appointed director of exports of DODGE MFG. CORP., Mishawaka, Ind.

Charles A. Menninger, succeeds Homer B. Fink as secretary and treasurer of the SANTA FE RAILWAY, Topeka, Kan. Chester A. Holcombe, appointed assistant treasurer.

F. A. Bade, appointed sales representative in Kentucky for A. MILNE & CO. F. J. Grant was appointed New England sales manager, with headquarters in Boston.

Joseph S. Quinn and Floyd B. Younginer, named sales representatives, St. Louis and Chattanooga district offices, respectively, of ALLIS-CHALMERS MFG. CO.'s general machinery division. Other appointments: Grant C. Kresge and Charles E. Dandois, sales representatives to the Philadelphia and Baltimore offices, respectively; Robert C. Nealey, Spokane district representative; Al Chalupnik, sales representative, Shreveport district.

Robert T. Brown, named Pittsburgh district manager for METAL & THERMIT CORP. Nicholas Kiernan has been appointed district manager at Newark.

E. H. Rocks, advanced to the position of vice-president of GREENE MFG. CO., Racine, Wis.

Kenneth E. Allen, joined the GARRETT CORP., Los Angeles, as publicity manager.

Edward L. Dull, appointed Detroit district sales manager for MERCER TUBE & MFG. CO.

Albert S. Kiefer, joined the Chicago sales and service staff of the industrial, railroad and aircraft detergents department of WYANDOTTE CHEMICALS CORP.

James S. Wolff, appointed Washington, D. C., representative of B. F. GOODRICH CHEMICAL CO.

Eric O. Ridgway, appointed director of research and development at THERMOID CO., Trenton, N. J.

Theodore R. Treadwell, appointed sales manager for CLOVER MFG. CO., Norwalk, Conn.

Arthur L. Collins, appointed director of sales of the HORACE T. POTTS CO., Philadelphia. Other appointments: W. Hughes Dunlap, special assistant to director of sales; John W. Reckard, sales manager; John H. Kern, assistant to sales manager, office sales; Joseph J. Folz, assistant to sales manager, stainless steels; Donald C. Taylor, assistant to sales manager, tool steels; Clee O. Worden, assistant to sales manager, machinery steels; Roy K. Clement, assistant to sales manager, special products; Robert A. Neeley, assistant purchasing agent.

William Bynam, elected executive vice-president of CARRIER CORP., Syracuse, N. Y.

Turn Page



JAMES M. KENNEDY, formerly vice-president in charge of the Rome, N. Y., Div., was elected president of Revere Copper & Brass Inc.



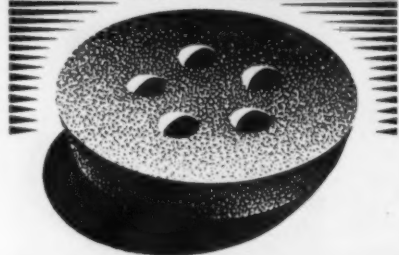
JAMES J. RUSSELL, elected as chairman of the board and chief executive officer of Revere Copper & Brass Inc., New York.



J. R. COFFING, elected vice-president — sales, advertising and general office administration, of Coffing Hoist Co., Danville, Ill.



Made for  
**FAST  
ROUGH  
HANDLING**



**ALSiMAG<sup>®</sup>**  
*Ceramic*  
**STRAINER CORES**

*Precision made Ceramic  
Strainer Cores speed pro-  
duction in many ways.*

Foundry men all over the nation will tell you that ALSiMag Ceramic Strainer Cores help them turn out more good castings per molder per hour. ALSiMag cores are made especially for the molder—to help him work faster and with greater accuracy. They speed production and substantially reduce rejects.

These cores are flat, kiln-fired ceramic pieces, precision made to fit into the gate of the mold. They strain incoming metal and regulate its flow.

Many shapes and sizes • Gas free • Show little abrasion from metal stream • Withstand all normal foundry pouring temperatures. Even thermal expansion.

**FREE SAMPLES:** Write today for free samples of sizes in stock. Special samples to your specifications made at moderate cost. Try them in your own foundry. See for yourself.

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**50** YEARS OF CERAMIC LEADERSHIP  
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MASS. • CHICAGO • LOS ANGELES • NEWARK, N. J.

## Personnel

*Continued*

Lincoln Kilbourne, appointed manager of sales, conveyor division; C. G. Hawley, becomes manager of sales, products engineering division; L. Cole has been named district manager, Jacksonville office, of JEFFREY MFG. CO. Paul Lawall, named general manager of sales, general engineering division; R. W. Sweitzer appointed New York district manager; W. K. Myers, to manage the Philadelphia office; and Paul Hendry becomes Boston district manager.

Dr. Francis C. Todd, named supervisor of a newly formed division of electronic physics at BATTELLE INSTITUTE, Columbus, Ohio.

Kenneth F. Ebbeson, assumes the duties of abrasive engineer, covering Arkansas, western Tennessee, Mississippi and Louisiana, for the NORTON CO., replacing David H. Paul who has been called to active duty in the U. S. Navy. Richard J. Kervick was appointed abrasive engineer in West Virginia.

Jack D. Moore, named plant superintendent at KAISER ALUMINUM & CHEMICAL CORP.'s Natividad, Calif., dolomite plant, replacing Walt Adams, who has been transferred to the Baton Rouge, alumina plant.

Howard O. Tracy, appointed comptroller and Frank E. Bilotti as chief accountant, Kaiser Engineers Div., HENRY J. KAISER CO., Oakland, Calif.

R. A. D'Amour, appointed assistant regional manager, Washington, D. C. region, for CUMMINS ENGINE CO., INC. G. W. Plondke, appointed assistant central regional manager, with offices in Chicago.

H. C. Green and R. E. Wendling, appointed district representatives for the construction materials division of GENERAL ELECTRIC CO. Mr. Green has been assigned to the Northeastern district to cover the Buffalo trading area, and Mr. Wendling has been assigned to the Pacific district with offices in Los Angeles.

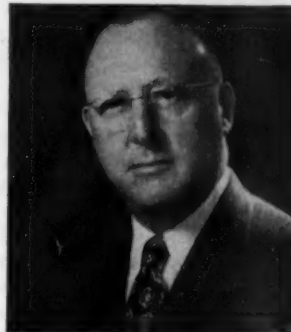
Joseph J. Morsman, Jr., named treasurer of NATIONAL LEAD CO., New York, succeeding Charles Simon who has retired. Mr. Simon had served 47 years with the company. William J. Welch was appointed manager of the metal department.



SAMUEL W. GIBB, appointed vice-president in charge of sales of C & D Batteries, Inc., Conshohocken, Pa.



JOHN P. ROCHE, promoted to executive vice-president of Heppenstall Co., Pittsburgh.



HARRY O. LANG, promoted to vice-president in charge of sales of Heppenstall Co., Pittsburgh.



ALFRED H. DREWES, recently elected a vice-president of National Lead Co., New York.



# Udylite

## SELENIUM RECTIFIERS

*last longer -*

### WORK BETTER AT LOWER COST

These new Udylite Selenium Rectifiers are built for top performance at high current densities. They're designed and engineered to give long, efficient service under tough usage. Actual factory-supervised tests prove this fact! A number of selenium stacks were operated continuously for 10,000 hours at the ambient temperature of 35° C at rated loads. Voltage output at the end of this grueling test was 98% of initial value. In addition, Udylite Selenium Rectifiers offer all of these other outstanding features:

- Compact, to save space and weight.
- Approximately 6,000 sq. in. of rectifying area.
- Wide range in combinations of standard sizes.
- From a few amperes to thousands of amperes.
- Permanent characteristics.
- Immune to atmospheric changes.
- Adaptable to any type circuit or load.
- High efficiency per unit weight.
- Economical in cost and operation.
- Simple to install and operate.
- No moving parts, no maintenance costs.

Have your nearby Udylite Technical Man give you the complete story about Udylite-Selenium Rectifiers. Or write to *The Udylite Corporation, Detroit 11, Michigan*, for literature describing these units. There's no obligation.



PIONEER OF A BETTER WAY IN PLATING

THE  
**Udylite**  
CORPORATION  
DETROIT 11, MICHIGAN

Actual reports show:

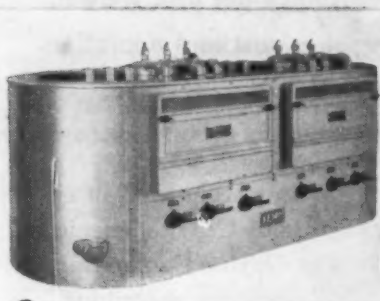


# KEMP

## Cuts Melting Costs



Above is a 44" pot with 10,000 lb. capacity. Casting rate: two tons per hour. Estimated fuel savings of up to 40%.



Many newspapers report actual fuel savings of from 50% to 60% on fuel with 10-ton capacity melting pot shown above.

### Kemp Gas-Fired Immersion Melting Pots Save up to 40% on Fuel Alone

Here's why you should replace conventional melting equipment with modern, efficient Kemp Immersion Pots. Actual reports show proof that Kemp Immersion Heating cuts fuel bills up to 40% and more. Now you can melt soft metals, lead, pewter, tin, or salt with maximum thermal efficiency and get double the rate of heat recovery.

#### POSITIVE HEAT CONTROL

Kemp Immersion Melting Pots have no brickwork to steal heat, no external combustion chamber, no carbon monoxide, no temperature overrun. You get high melting rates, reduced dross formation, speed of temperature recovery after adding cold materials . . . PLUS an estimated fuel saving of up to 40%.

#### FOOLPROOF OPERATION

Each installation includes the Kemp Industrial Carburetor to assure complete combustion, lower installation cost. Tell us your heating or melting requirements. We can help you make your unit more profitable.

# KEMP IMMERSION MELTING POTS

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Write for Bulletin for technical information.  
Address: C. M. KEMP MFG. CO.  
405 E. Oliver St., Baltimore 2, Md.

CARBURETORS • BURNERS • FIRE CHECKS • ATMOSPHERE & INERT GAS GENERATORS  
ADSORPTIVE DRYERS • METAL MELTING UNITS • SINGING EQUIPMENT • SPECIAL EQUIPMENT

## Personnel

Continued

Robert C. Anderson, appointed sales manager for Detroit electric furnace division, KUHLMAN ELECTRIC CO. Mr. Anderson will be located at Bay City, Mich.

Dr. Leo J. Novak, appointed as chief of the biological laboratory division of the COMMONWEALTH ENGINEERING CO., Dayton.

William H. Hazlett, appointed Eastern sales manager for AUDIO & VIDEO PRODUCTS CORP., New York. Robert D. Winston, appointed sales-service manager.

J. S. Askey, joined the staff of the ELLIOTT CO., Ridgway Div., Ridgway, Pa., as assistant works manager.

Robert I. Hicks, appointed president of Lamson Corp., Syracuse, N. Y. Francis D. Weeks, is promoted to the newly-created position of chairman of the board. Mr. Hicks succeeds Carl F. Dietz, who is retiring as president of this subsidiary, but will remain president of Lamson Corp. of Delaware.

L. J. Smith, appointed Eastern regional sales manager of CHIKSAN CO., Brea, Calif. and will be located in the company's Newark office.

Thomas F. Griffin, appointed Holyoke Works purchasing agent for WORTHINGTON PUMP & MACHINERY CORP., succeeding Milton Roberts who has resigned.

George Walker Scudder, Jr., elected to the board of directors of the PENNSYLVANIA FLEXIBLE METALLIC TUBING CO., Philadelphia.

## OBITUARIES

Edward Griffith, 68, president of the Glen Alden Coal Co. and chairman of the Anthracite Operators Wage Negotiating Committee. In addition Mr. Griffith headed the Delaware, Lackawanna & Western Coal Co., and the Lehigh & Wilkes-Barre Corp.

W. Bruce Ogden, 58, vice-president of Valley Mould & Iron Co., Youngstown.

Dr. F. F. Foss, a director and chief metallurgist for the Wheeling Steel Corp., in Santa Barbara, Calif.

Charles E. Coyle, 51, general traffic manager of the Otis Elevator Co., in Newark, N. J.

Walter N. Larke, 62, assistant general manufacturing manager at Buick Motor Div., Flint. Mr. Larke was a veteran of 41 years at Buick.



# RECLAIMING ALLOYS

## from tool steel mill wastes



**By A. J. Schied, Jr.**  
Vice-President  
in Charge of Metallurgy  
and



**W. J. Mathews**  
Supt. of Melting  
Columbia Tool Steel Co.  
Chicago Heights, Ill.

Critical alloys are now being recovered by an electric furnace process which are ordinarily lost in the form of mill scale, grinding chips and other process waste during tool steel manufacture. Every pound of alloy recovered adds 5 lb of useful material available for consumers and the defense effort. Alloy thus salvaged could amount to 5 to 8 pct of our total tool steel production.

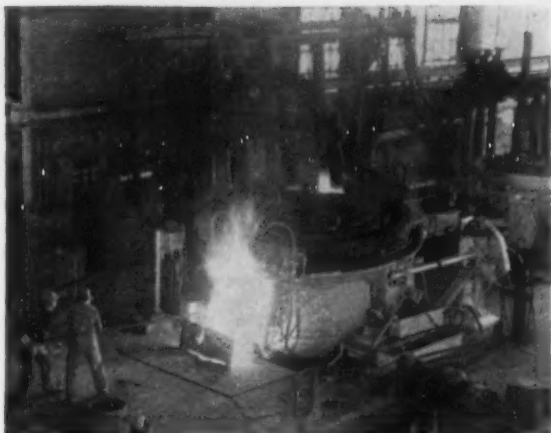
**D**ue to the urgency of the present situation every effort must be made to produce an adequate quantity of tool steels for the defense program. Production not only depends on scrap but many critical alloys, including tungsten, molybdenum, chromium and vanadium.

Due to the shortage of these critical alloys, tool steels have been included under control order M-1 of the NPA, which not only provides rules and regulations for placing, accepting and scheduling orders, provides for allotment and control of inventories, but also close alloy inventory control by the manufacturer.

The shortages of these alloys, along with

the delays in the distribution of alloys, make it mandatory that the mills must make every effort to use all alloy containing materials at their disposal in order to provide as great a tonnage of tool steel as possible to the customer.

The demand for all tool steels during the first 5 months of 1951 has more than doubled that of the same period last year. The use of high-speed steels, which consume substantial quantities of tungsten, molybdenum, chromium and vanadium, increased by 350 pct during the same interval. Approximately 35 million lb of high-speed steel were produced, compared with 11,600,000 lb in the same period of 1950. As



RECLAMATION FURNACE used for salvaging waste alloys.

### Reclaiming alloys (continued)

high-speed steels contain up to one-fifth alloy, it is evident that the demands made on alloy resources have been very severe and that every pound of alloy saved makes possible the manufacture of 5 lb or more of high-speed steel.

Sources of scrap and alloy losses frequently not given due consideration are from furnace slags and pouring pits, grinding chips and alloy containing mill scales. Mill losses from these three sources range from 5 to 8 pct, and represent a substantial poundage of alloys and iron on an annual basis.

### Mill scale kept separate

Mill scale which forms during forging and rolling is a substantial source of valuable alloy. Usually in tool steel practice, the high-speed steel scales formed during forging of the ingots are kept separate and the alloys recovered. However, in such operations as finishing, either on the hammers or rolls, or during hammer or rolling mill cogging of small batches of high-speed steel along with other compositions, the practice has been to discard these mixed mill scales. Grinding chips also constitute a very important source of valuable alloys. These can be cleaned magnetically to remove the grinding wheel particles and subsequently processed to recover the alloys and iron.

Recovery of metal from furnace pits can be easily accomplished in part with the mill magnet. Other melting shop refuse and slags containing valuable metal particles can be broken up and passed over a magnetic pulley before sending to the dump. Analysis of the discarded scales at Columbia Tool Steel Co. showed them to average 2.57 pct W, 1.75 pct Cr, 0.78 pct Mo and 0.15 pct V, and the alloy content of the grinding chips was substantially greater.

The melting and refining of grinding chips and scale in any great quantity presents quite a furnace problem. A procedure has been developed for refining this material in a 6-ton top charge electric furnace using all alloy scale,

grinding chips and magnetically recovered metal particles that has resulted in a substantial recovery of metal and alloys. All of the valuable alloys, tungsten, molybdenum, chromium and vanadium, are recovered by this process.

With these wastes averaging from 5 to 8 pct of the total tonnage melted, it appeared desirable to develop a refining routine for these wastes that could be easily manipulated without excessive refining time, cutting of the furnace banks and side wall, electrode erosion, foaming of the slag, or flaming. The amount of alloys and iron recovered must be high enough to warrant the costs involved and the chemistry of the product obtained must be within useful limits.

The reducing agents used in refining these materials were 75 pct ferrosilicon, calcium carbide and ground coke. The products of reaction from these reducing agents are CO, CO<sub>2</sub> and SiO<sub>2</sub> and the amount of these products resulting from this refinement is substantial.

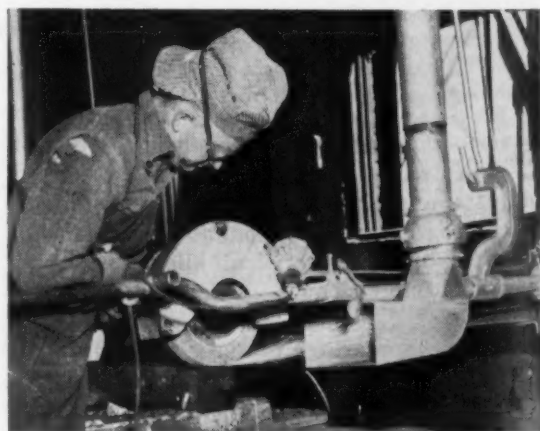
If the refining were done entirely with carbonaceous materials the amount of gases generated with resulting flaming would make it extremely difficult to work the heat. It could also result in overheating the superstructure

TABLE I

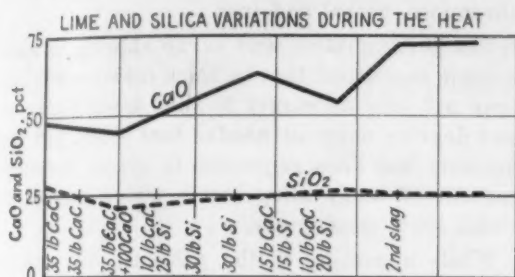
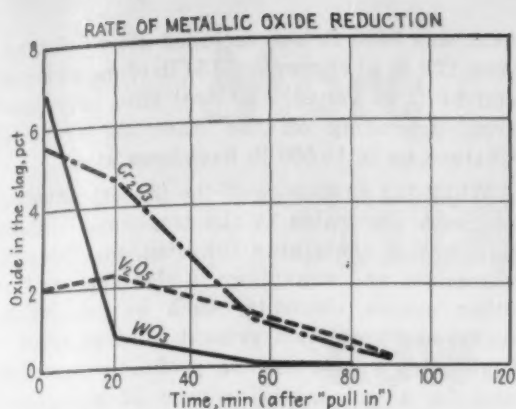
### TYPICAL MIX USED

	lb
Charge:	
Grinding chips .....	2500
Mill scales .....	2500
Magnetically recovered particles .....	3500
Plate scrap* .....	1000
Total charge .....	9500
Back charge:	
Grinding chips .....	500
Mill scales .....	2000
Total back charge .....	2500

\* Used to help maintain arc during melt-down.



ONE OF A BATTERY of seven swing grinders used for grinding high-speed steel billets. The wheels are 16 in. diam x 2 in. Alundum. All of the wheels are connected to a dust collector system.



RATE OF REDUCTION of metallic oxides is shown above. Variations in lime and silica during heat appear below.

of the furnace. If the reduction were made wholly with silicon the resulting quantity of  $\text{SiO}_2$  would have to be neutralized with lime in order to maintain a reducing slag and the resulting slag volume would make it unmanageable. A third factor is the resulting chemistry of the product from the refinement. Both carbon and silicon in the final product must not be in such quantity as to limit its usefulness.

Following many earlier experiments, the typical mix was developed as shown in Table I. This is used at present and indicates the possibilities of refining these materials. Suitable chemistries are maintained and the duration of the heat does not exceed  $4\frac{1}{2}$  hr. In addition to this, slag control is easily maintained, the furnace bottom and side walls are not unduly eroded and good working conditions are maintained throughout the heat.

Proper slag manipulations for satisfactory refining are important. The scale and grinding dust used in the charge is mixed with 10 lb of 75 pct ferrosilicon, 5 lb of coke and 12 lb of lime per cwt. After a good-sized pool has formed, the slag is dusted at 10 to 15-min intervals with 40 lb of CaC, 20 lb of C, 15 lb of 75 pct FeSi and 20 lb of lime. The amounts of these elements may be shifted somewhat, based on slag appearance and slag action.

Slag appearance is very indicative as to the progress of the heat which, with controlled manipulation, gradually changes from a black slag, vitreous in appearance and high in alloy content, to a dull colored light brown, which analyzes approximately 50 pct CaO, 25 pct  $\text{SiO}_2$ , tungsten nil, molybdenum nil, 0.30 pct Cr, 0.10

pct V. The slag at this point is raked off and the back charge added. The relative rate of reduction of the oxides, tungsten, chromium and vanadium is shown in the diagram, left.

The back charge is mixed with 10 lb of 75 pct FeSi and 5 lb of ground coke per cwt. The power is then put on and the reduction is carried on in the same manner as with the first slag. Slag pancakes are taken at 10-min intervals to observe the basicity of the slag and to determine the progress of the reduction. Lime is added at 10 to 15-min intervals to maintain the desired basicity.

After the back charge is refined, the slag can again be raked off and another charge added. The only limitations to the number of back charges that can be used are practical ones such as bottom and slag line erosion which could become critical as 60 to 90 min are required to reduce each back charge.

After the final slag has turned light brown to white, it is free of alloy and the heat is tapped. The tapping temperature varies from  $2650^\circ$  to  $2850^\circ\text{F}$ , depending on the carbon content of the heat. The metal is poured into 300 to 600-lb ingot molds which are well suited in size and weight for recharging. The data in Table II indicate the speed with which these reductions can be accomplished.

The carbon and silicon content of the final product can be varied by minor shifts in the

TABLE II

### MELTING PRACTICE

Power on to slag rake-off	2 hr 15 min
Time to refine back charge	$1\frac{1}{2}$ hr
Total time on heat	4 hr 10 min
KWH per ton charged	650
Melt-down voltage	226
Refining voltages	100 to 150
Metallic	9600 lb
Heat analysis: C-1.60, Mn-0.32, P-0.015, S-0.010, Si-0.47, Cr-2.48, W-3.86, V-0.67, Mo-1.40.	



SHOP MAGNET is very effective for removing metallic chips from abrasive wheel particles. Approximately 90 pct of the grinding wheel particles are removed.





THE MAGNETIC PULLEY setup used for cleaning the melting department slags, pit refuse, sweepings, etc. These are collected in a hopper which feeds onto an inclined belt equipped with a magnetic pulley at the discharge end. The nonmetallic refuse is discharged into the truck.

#### Reclaiming alloys (continued)

amount of silicon, coke, and carbide used. Likewise, the ratio of tungsten and molybdenum in the final product can be varied depending on the quantities of tungsten and molybdenum containing scales used. Maintenance of a minimum of 2:1 CaO/SiO<sub>2</sub> ratio in the slag is an important factor in keeping both carbon and silicon within desired ranges.

The total metallic weight recovered in this

heat was 9600 lb and included 370 lb of tungsten, 238 lb of chromium, 134 lb of molybdenum and 64 lb of vanadium. Heat sizes vary, however, depending on the materials available. Charges up to 15,000 lb have been used.

While the economics of the present situation are more favorable to the treatment of these mill wastes containing tungsten, molybdenum, chromium and vanadium, it also appears that other scarce elements, such as manganese, nickel and chromium present in other types of high alloy steels, can be profitably recovered and be a substantial source of manganese, chromium, nickel and iron.

The present alloy and scrap shortages have become so critical that in some instances it has been not only necessary to shut down furnaces and deprive users of needed tool steel, but the industry has been requested to lower the alloy content of many alloy steels which could restrict their usefulness.

While appealing to the patriotic citizens to flatten out their tin cans and making appeals to customers for prompt return of valuable scrap, it behooves the tool steel mills to review their own practices to be sure that no valuable alloy containing material is being inadvertently stockpiled or going to a dump, thus depriving the users and the defense effort of a single ounce of previous scarce alloy and the resulting product.

## Automatic oilers cut maintenance costs on boring mill

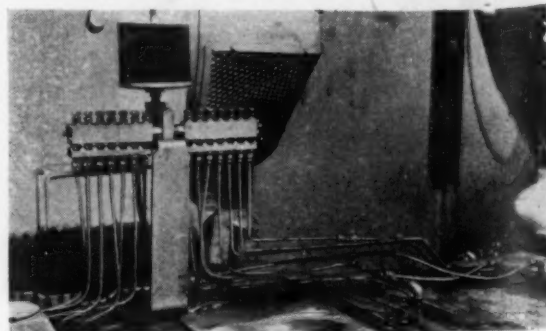
Three solenoid operated automatic oilers have replaced 30 manually operated individual oiling cups on a 100-in. boring mill at Nordberg Mfg. Co., Milwaukee. Annual lubricating cost has been cut 74 pct, with a 50 pct saving in oil used, and a 90 pct reduction in the operation and maintenance requirements of oilers. Annual lubricating cost was cut from \$281 to \$75.

Previously, each cup was filled daily by the machine operator who had to shut the machine down. Over-oiling, uncontrollable flow of oil and failure to shut off oilers at night created a loss of more than 31 gal of oil annually. Spilled oil endangered personnel. Manually operated oiling cups tended to lubricate excessively at the start and gradually starve bearings during the remainder of the operation, causing excessive wear and tear on bearings and reducing the efficiency and life of the machine.

All 30 points on the boring mill are fed from the three centrally located and readily visible reservoirs. Sight feed valves regulate the flow of oil to each point.

Not a single bearing has had to be replaced since the automatic electro oilers were installed.

Solenoids of the Oil-Rite oilers are connected across the line of the driving motor so that their operation starts and stops with the motor. The machine can be lubricated while running, eliminating down time. Reservoirs are filled by a night oiling crew.



THREE SOLENOID operated automatic oilers have replaced 30 oil cups on big boring mill at Nordberg Mfg. Co. Oil, machine time and operator time have been saved.

More

# TITANIUM OXIDE

## now available

World's largest electric  
furnace used in unique process

Part II

By D. I. Brown  
Technical Editor

An electric furnace 54 ft long equipped with six electrodes is used to make a high  $\text{TiO}_2$  concentrate. A slag containing about 75 pct  $\text{TiO}_2$  and iron is tapped from this furnace. The feed ore is crushed, mixed with anthracite coal and gravity fed into the furnace through a sprung arch roof. The furnace is all-basic brick and operates as a sealed unit under slight pressure. Additional units are under construction.

One of the most unique metallurgical techniques evolved in recent years is proving successful at the Sorel, Canada, plant of Quebec Iron and Titanium Corp. The melting process produces titanium-rich slag and molten iron with an electric arc furnace which is 54 ft long, 25 ft wide and has 6 electrodes. The operator cannot see into this novel furnace. It operates as a sealed unit and electrically it is really three single-phase arc furnaces in one shell.

Prior to the first operations at Sorel, no one was sure the process would work at all. There was considerable doubt that the combination ilmenite and hematite ore could be reduced or that the slag and iron could be tapped separately. Small pilot plant experiments, started in 1945 by the New Jersey Zinc Co. metallurgists who invented the process, has not fully established the concept. However, the huge demand for  $\text{TiO}_2$  from the pigment industry brought the \$17 million gamble at Sorel within the realm of reasonable risk.

The Quebec Iron and Titanium Corp., formed in 1948 jointly by Kennecott Copper and New Jersey Zinc, has now established beyond all doubt the practicability of the process which

as late as 1947 was but a metallurgists' dream.

The hematite-bearing ilmenite ore contains but 35 pct  $\text{TiO}_2$  while the slag tapped from the electric arc smelter averages 70 pct  $\text{TiO}_2$ . Therefore the process is simply one of concentrating a raw material for further use. The high grade, low sulfur pig iron is a byproduct of the  $\text{TiO}_2$  concentrating process.

With one furnace in operation and four others under construction, the plant is producing about 235 net tons a day, 135 tons of which are slag or concentrated titanium ore. About 100 tons of molten iron are also produced per day. The iron from the treatment furnace is refined, desulfurized in a standard 60-ton electric furnace and poured into 23x25 in. ingots which are sold as high grade charging metal for other standard steelmaking processes.

Capacity production of 300 net tons a day on the first treatment furnace will soon be reached. By mid-1952 the Sorel plant will reach a daily consumption of 1500 tons of charged material when the five melting furnaces, plus the two refining furnaces, are all in operation. At this rate of capacity, the plant will produce

### More titanium oxide (continued)

500 net tons of iron and 700 net tons of slag daily. The remaining 300 tons go off as CO which also will be used as fuel to dry the incoming ore and coal.

The ore mined at Havre St. Pierre, see *THE IRON AGE*, Nov. 1, 1951, p. 119, is delivered in 10,000 gross ton lots via boat to the Sorel dock. A Wellman unloader delivers the ore from the ship's hold to a belt conveyer which carries the ore to stockpile. Anthracite coal is delivered by rail and stockpiled via belt conveyer also. The anthracite is used to reduce to ore in the melting furnace. Coal rather than coke is used because the coal can be obtained in a consistent size, has better physical characteristics and is lower in sulfur content than coke. A barley size or No. 2 buckwheat anthracite is used at Sorel.

#### **Ore crushed to minus $\frac{5}{8}$ in.**

Blending in the ore stockpile is controlled to produce a charge ore grade containing about 40.5 pct  $\text{Fe}_2\text{O}_3$  and 34.5  $\text{TiO}_2$ . The ore and coal are conveyed separately to the bins at the top of the dryer and crusher building. Each material is dried separately using oil fuel. The plant will soon be using the CO from the melting furnace instead of oil at the driers.

The 2-in. screen size ore is crushed to a minus  $\frac{5}{8}$  in. size. All crushed and dried materials are belt conveyed to separate dry storage bins. From these bins the coal and ore are fed into an automatic weighing machine which mixes the two materials. The present mix is 15 parts of coal to 100 parts of ore.

The two materials, now intimately mixed, are then stored in hoppers above the melting furnace or discharged directly into the surge bins which supply the 76 feeder lines in the top of the furnace.

The feeders continuously supply the furnace and are controlled by time clocks which can be set to vary the rates of charge. The feeder lines are spaced in four rows along the length of the Chrom-magnesite sprung arc roof. The charged material, gravity-fed down around each electrode, melts; the iron collects on the 25-ft wide hearth with the slag on top. The normal iron bath is 12-in. deep while the slag depth may vary from 30 to 40 in. in depth.

#### **Suitable refractories big problem**

Possibly the biggest single problem in the Sorel furnaces is suitable refractories. The hot slag containing 70 pct  $\text{TiO}_2$  is corrosive to any known refractory so that the basic furnace brick is in constant danger of being digested. To preclude such erosion, the charge material is distributed along the side and end walls by the feeders. The unmelted charge thus contains the molten materials and protects the basic brick walls.

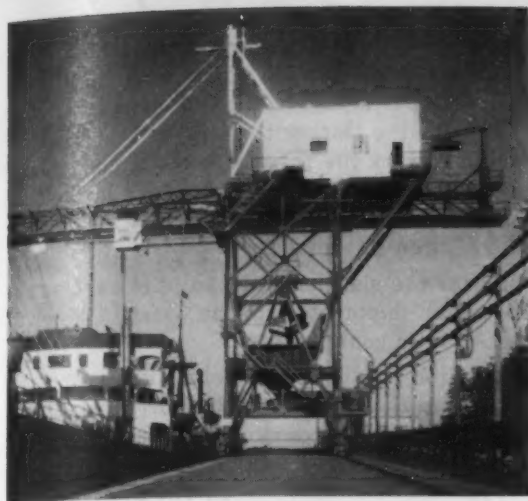
This protective layer of mix between the basic banks and the molten bath is constantly consumed so that rate of feed and proper distribution of charge are critical. Forty-eight thermocouples are imbedded in critical parts of furnace walls and bottom. There are six in the hearth area. Close watch of the automatically recorded temperatures, by the thermocouples in the furnace walls, affords some measure of the effectiveness of the unmelted protective charge blanket between the walls and the molten bath. These temperature measuring instruments, plus probe bars, serve as eyes for the operators who have no other way of knowing the conditions inside the furnace. The outside steel shells of the furnace are water-cooled, as are the slag and iron tap hole arches.

The molten iron on the hearth protects the hearth refractories from the corrosive slag but



SOREL PLANT where the ore is concentrated. Ore is unloaded and conveyed from the dock to the ore stockpile shown at the lower left. One furnace is operating, with four others under construction. Courtesy Link-Belt Co.





WELLMAN UNLOADER is used to empty the 10,000-ton cargo from the hold of the ore carrier at Sorel. Coal is shipped in by rail at present. Courtesy Link-Belt Co.



TAPPING SPOUTS of the furnace shown from the pit side. Only three of the four tap holes are shown here. The center spout is for iron. Slag is tapped through the other two.

trouble may occur at the junction of the two materials if the charge material is not precisely distributed and piled within the melting zone. The furnace operates as a sealed unit under slight pressure. Pressure on the furnace is adjusted by the water volume used at the gas scrubbers located at each end of the furnace. Positive or negative pressures can be had by using the proper water venturi flow.

Refractory troubles with the basic roof have not been severe except when the roof has been overheated. Roof temperatures have run between 2460°F to 2910°F without difficulty but the optimum roof temperature has not yet been established. The center line of the sprung arch roof is 11 ft 6 in. above the center line of the inverted arch hearth. The six electrodes are spaced on 6½-ft centers through the roof.

These openings along with the other seventy-six 6-in. square feeder holes make the roof somewhat of a ticklish piece of masonry. Four Ray-o-tubes are also installed in the arch to record roof temperature and preclude overheating.

The furnace constructed by Dominion Bridge, Ltd. and Fraser Brace Eng. Co., Ltd. has operated between 220 to 440 v. The maximum power consumption used so far has been 16,000 kw, although the rated power input is 18,000 kw. The graphite electrodes on the first furnace are 29¼ in. diam. The new units will be equipped with 24 in. diam electrodes.

Under regular operating conditions, the furnace is tapped eight times in a 24-hr period. Slag is tapped every 4 hr and iron every 12 hr. The molten slag, at a temperature of about

BELT CONVEYERS take the ore from the unloader to stockpile. Through the incline at the extreme right the coal and ore are carried to the top of the mixer-crusher building. Courtesy Link-Belt Co.



# More titanium oxide (continued)

TABLE I SLAG ANALYSIS

Compound	Pct
TiO <sub>2</sub> .....	70.0
Fe O <sub>2</sub> .....	4.0
Metallic iron .....	4.0
MgO <sub>2</sub> .....	5.0
Al O <sub>2</sub> .....	6.0
Cr O <sub>2</sub> .....	0.30
V O <sub>2</sub> .....	0.60
MnO .....	0.20

TABLE II IRON ANALYSIS—AS TAPPED

1.00 pct C
0.50 pct S
0.06 pct Ti max
No phosphorus, Mn and Si nil

1600°F, is tapped into a ladle and is taken to a pig machine which makes slag cakes 30 in. long by 10 in. wide by about 1 in. thick, weighing around 50 lb. These cakes are conveyed by the pig machine under water sprays to a dump outside the building. The slag is later crushed to minus ½ in. size and sold f.o.b. Sorel. An average slag analysis is shown in Table I.



MOLTEN IRON is a byproduct of the ore treating process. The furnace yields about 100 tons of iron and 135 tons of TiO<sub>2</sub> concentrate slag every 24 hr.

Usually the total iron runs 8 pct, half of which is metallic and half of which is an iron oxide. Iron oxide is a flux to the slag. The lower the iron oxide the thicker the slag, so that to satisfactorily work the furnace, a minimum oxide is necessary. The amount of iron oxide in the slag is a function of available carbon or the amount of coal used in the charge.

So far the slag has been shipped out by rail, but water shipments into the Great Lakes or to the Atlantic could be used.

The iron produced at Sorel is different chemically than that made by other methods. A typical tap analysis is shown in Table II. The iron is further refined into the finished product.

The tap iron is charged directly into the 60-ton electric refining furnace. Using a high lime slag the iron is desulfurized to 0.05 pct max S and teemed into 23x25 in. ingots weighing 7000 to 9000 lb each. When the new pig machine now under construction is operating, 100-lb pigs will be available for the foundry trade.

Regular medium carbon steel has been made in the refining furnace experimentally. At the moment, however, the regular product is a high-grade charge material. Recent experiments in desulfurizing have produced iron of 0.025 max S and it is believed that this method can be used regularly as standard practice in the near future. The refining furnace produces about 50 net tons of low sulfur iron every 4 hr.

Although the Sorel installation was originally built to supply the pigment industry with high concentrated TiO<sub>2</sub> ore, the titanium metals industry is intensely following the progress of the Quebec Iron and Titanium Corp. The TiO<sub>2</sub> rich slag from Sorel could be employed to advantage to make titanium tetrachloride which is used in titanium sponge production for the Kroll process. It appears the TiO<sub>2</sub> slag from Sorel may be a major source of raw material for this country's fast-growing titanium metals industry.

Part I of this two-part article appeared in the Nov. 1 issue, p. 119.

# SAVE TIME, MONEY

## with three-dimensional planning



By Homer H. Dasey  
President  
Visual Planning Co., Inc.  
Oakmont, Allegheny County, Pa.

Management can save time and money with visual, three-dimensional scale models of plant layouts. Errors can be minimized. Plant and physical setups can be easily visualized by all personnel. The effect of equipment location on material flow can be studied in advance. A method of quickly making inexpensive plant layout blueprints is available.

More and more executives are finding the visual or three-dimensional, scale model a time and money-saver. But an exact scale layout is a production. Too often the idea that it is just a few models on a table-top proves an expensive error and results in failure.

A three-dimensional layout reduces the factors of any planning project to physical fact. Technical and non-technical personnel can more readily visualize the problems involved.

In order that nothing be overlooked, today's industrial complexities require continued explanations and translations of effort among management, personnel, maintenance, production, safety and other groups. Using a scale model, each person can participate in physical demonstration of ideas through group experiments on the layout.

Many persons work together to prepare plant layout. With a visual layout the percentage of error is reduced. By the check and balance of group participation, plus the fact that all thinking is recorded concretely, mistakes are eliminated as planning progresses.

The complete unit should be made to building prints, detailing the building area down to the

last column. This planning base should be made of Lucite or other clear plastic in standard 2x3 ft sections that can be pulled out separately to make final reproduction prints.

Every piece of plant equipment must be accurately produced so the layout will exactly duplicate all plant elements in size and appearance.

Planning can only be done properly when all factors pertinent to the problem are known. It is important that every detail of plant and equipment be available before definite decisions affecting overall layout are made.

Floor space must be detailed as to exact area, either using a Lucite building model, or 2x3-ft standard grid sheets engraved in 1/4-in. squares.

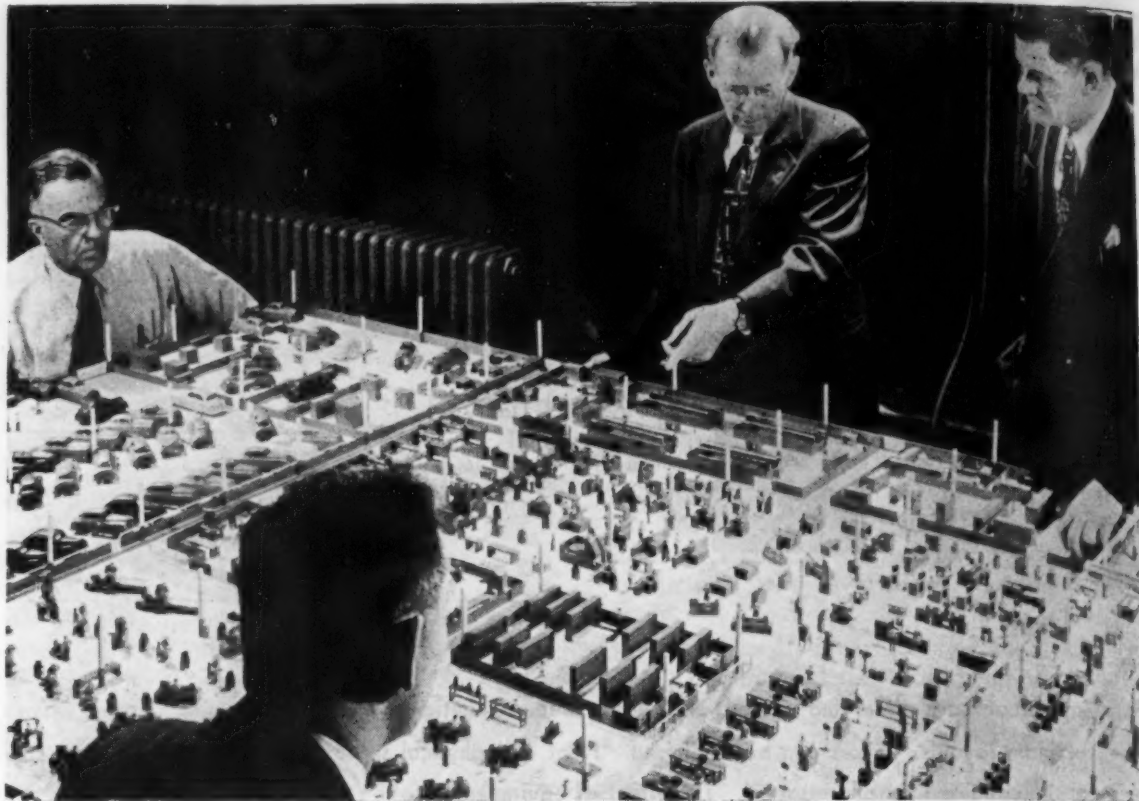
The location of interior and exterior permanent walls, including traffic openings, must be clearly detailed for material handling problems that will arise. Columns must be precisely located and shown to the height of the working ceiling.

Temporary partitions must be located for enclosure as tool rooms, stock rooms, storage and offices so that proportional areas may be shown.

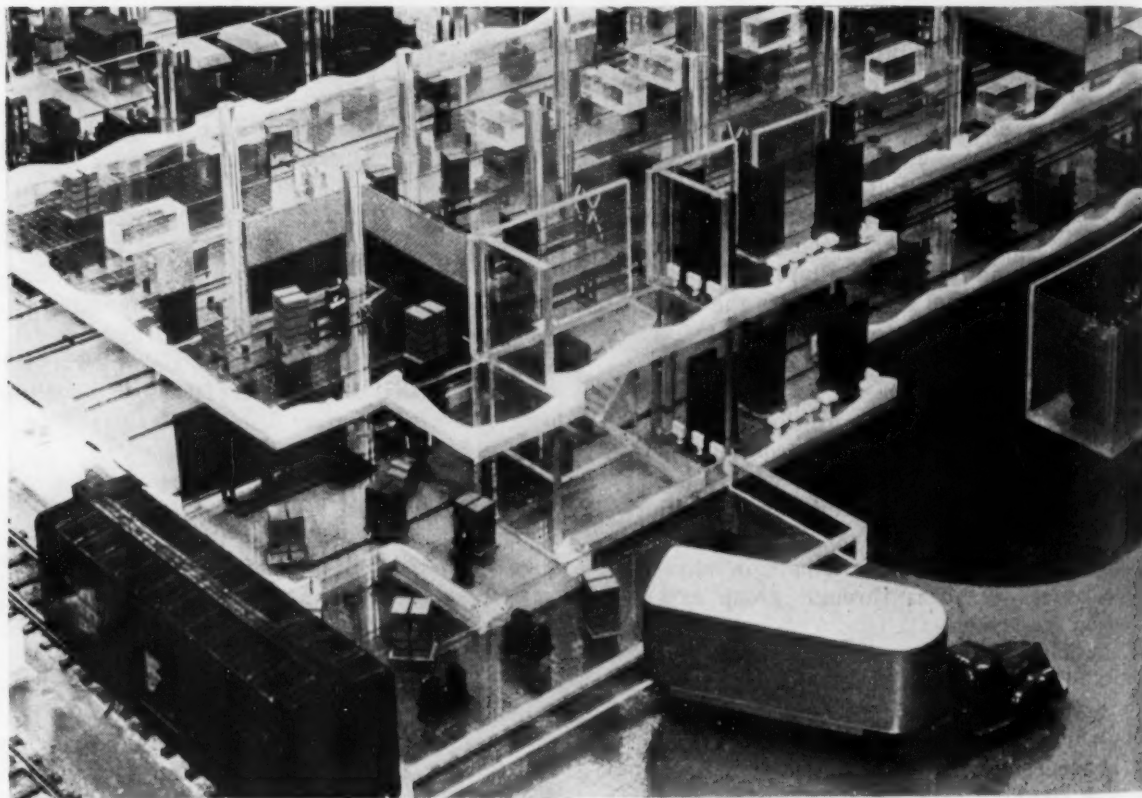
Overhead cranes or conveyer systems must be completely detailed because material handling



Three dimensional planning (continued)



SINGLE-STORY layout is set up for preconstruction planning. Complete model showing production and non-production equipment as well as details of the building enables personnel to visualize final plant.



MATERIALS FLOW is often hindered by poor placing of equipment and open areas. Here Plexiglas floors and walls allow planners to avoid bottlenecks which would hinder smooth flow of work from department to department.

problems are the largest one factor in any plant.

Important wiring and piping runs should be shown. These should be so color-coded that various building services are understood by all concerned—not just the layout engineer.

Mezzanine or stub floors, loading platforms, tunnels, etc., must be clearly shown.

### Accurate machine models essential

Accurate models of every piece of machinery in the plant are essential. These machines determine overall movement within the plant. They occupy less than 20 pct of total floor space. But from an "activity" standpoint, they determine the flow and bulk-movement of materials throughout the plant.

Accurate models of every piece of nonmachine equipment that occupies floor space are needed. Such items include: Work benches, tool tables, shelving, stockroom equipment, painting and dipping equipment, conveyers, shop trucks, bins, pallets, storage racks, heat treating equipment, shipping equipment, tool cribs, parts storage.

This non-production equipment is needed to show exact floor-load conditions. It is *not* possible to plan efficiently unless all existing or required equipment is used just as it is in the plant.

Based on layouts built for some 250 plants

in the last 5 years the average ratio of non-production to production equipment is six or seven to one. A layout of any value could not be achieved with machine elements alone, which would occupy only 12 to 20 pct of plant area. Since 80 pct of the average plant floor area is occupied by non-production equipment, aisles and throughways, it is important that every piece of equipment be represented in the model.

By a simple method much time may be saved in lettering and drawing final prints. The layout should be complete in every detail, all equipment properly placed and the plan approved.

### Exact templates needed

The simplest way to secure prints directly from the three-dimensional layout is to have one exact template on film to match every piece of model equipment. These film templates, having a pressure-sensitive cement back, are used as follows: When the layout is complete, fix the models in place with a pressure-sensitive cement. Then invert the layout. Place a film grid on the Lucite base and mount the templates on the film grid sheet so as to cover the base of each piece of equipment with proper film template.

The result is a film master which can be run through any reproduction machine (blueprint, Ozalid, etc.), for as many print copies as desired.

## NEW BOOKS

*"Fuel Oil Manual,"* by Paul F. Schmidt. Those who buy, use or sell fuel oils for industrial heating or power generation will find much help in this manual. Technical discussions of interest only to chemists and refiners have been avoided. The properties and limitations of each grade of fuel oil are thoroughly discussed. Impurities and their effects on combustion are described. Tests which can be made to check or avoid impurities and a review of common fuel and combustion troubles are included. The Industrial Press, 148 Lafayette St., New York 13, N. Y. \$3.50. 160 p.

*"Payment by Results,"* studies production-payment plans in use in this and other countries. Prepared by the International Labor Office, the first part of the book is based on information supplied by government, and employers' and workers' organization, in response to a special inquiry. The second part contains a statement of general principles concerning use of such systems of payment drawn up by the ILO at Geneva in April 1951. Chapters on procedures used in applying such systems and the effects on earnings, output, costs, industrial relations and health are of special interest. International Labor Office, Geneva Switzerland. \$1.25. 204 p.

*"Welding, Joining and Cutting of Gray Iron,"* by C. O. Burgess, is the second of a series of three technical manuals on gray iron castings. New processes and improved techniques for successfully welding gray iron are described. Written in plain language, the subject matter covers gas, arc, inert-gas, braze-weld, brazing, thermit and flash welding methods. The processes open up new design possibilities for successfully joining gray iron to other metals, and facilitating repair and maintenance operations. Gray Iron Founders' Society, Inc., 210 National City-E 6th Bldg., Cleveland 14, Ohio. \$1.00. 40 p.

*"Herbert H. Dow, Pioneer in Creative Chemistry,"* by Murray Campbell and Harrison Hatton. The energy, native genius and foresight of a young pioneer in American industrial chemistry helped make America independent of European chemicals. And it helped build the great Dow Chemical Co. Working with borrowed money and homemade equipment, Dow first manufactured bromides. Later other chemicals were added. Bromine was extracted from sea water. The Dow plant grew and the company became one of the country's industrial giants. Appleton-Century-Crofts, Inc., 35 West 32nd St., New York 1, N. Y. \$3.50. 168 p.

# GEARS SPUN IN MOLTEN SALT HARDEN TEETH ONLY



By William F. Sorenson  
Chief Metallurgist  
Yale & Towne Mfg. Co.  
Philadelphia

Teeth of gears drop-forged from SAE 4140 are being hardened to Rc 52 while gear core hardness is kept at Rc 36 in a new method developed at Yale & Towne Mfg. Co. Gears revolve in a molten salt bath, are quenched in oil, then tempered. Gears show uniform hardness throughout the area treated. Scaling has been eliminated.

**S**teel gear teeth are selectively hardened by revolving in a molten salt bath in a new method developed by the Philadelphia Div. of Yale & Towne Mfg. Co. The method is applicable to many types of gears and has several advantages.

The problem was to harden the teeth on a drop-forged SAE 4140 steel gear to Rc 52 while maintaining a core hardness of Rc 36. This gear is 11¼ in. diam, weighs 36¼ lb, has 18 splines in its hub and must be practically distortion free. Due to severe stresses in service, hardness must be uniform and symmetrical without quenching strains.

Gear blanks are first normalized and annealed to Bhn 195-200 and then rough cut and hardened all over Rc 36. It is then sand-blasted, splined

to finish size and the face and teeth are machined. The next step is to harden the gear teeth without disturbing the finished inside diameter.

Overall heating, induction hardening and flame hardening were tried. Burning, overheated teeth ends, and scaling were experienced. The latter necessitated sand-blasting of the gears which lowered their wear resistance.

## Salt bath logical treatment

Distortion up to 0.005 in. was encountered. This was undesirable since the gear was press fitted on a splined shaft. Excessive quenching stresses resulted in a high percentage of rejects.

Salt bath heating seemed a logical answer. Scaling would be eliminated, and uniform heating would minimize distortion. However, salt baths



are generally used for heating a whole part, not just the circular edge of a part.

A "liquid flame hardening method" was devised which made an ordinary salt bath semi-automatic in operation. The same activated cyanide bath used for regular carburizing work is employed, although neutral baths are sometimes used.

Four gears are locked on a shaft which is free to revolve in a simple fixture. The fixture is hoisted over the bath and the gear teeth immersed in salt to a depth of about 1 in. An electric motor is connected to the shaft and rotates the gears.

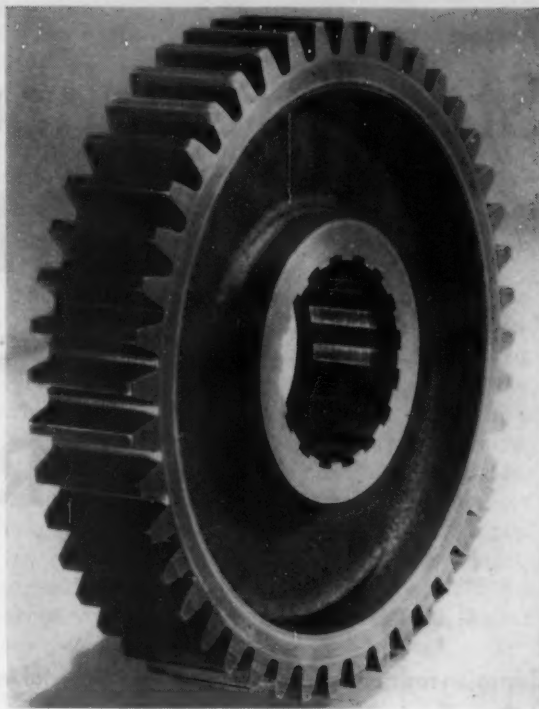
#### Gears oil quenched and tempered

The gears revolve at 40 to 45 rpm for 4 min. When heating has been completed, the gears are quenched in oil at 150°F. The temperature of the salt bath is maintained at 1525°F. The gears are tempered following the oil quench for about 45 min at 430°F.

The results of this treatment are almost ideal. Gears are hardened to Rc 52 and show uniform hardness throughout the area treated. There is no scale and distortion is slight if anything, the hub of the gear closes slightly—less than a thousandth of an inch—indicating that the gear is in compression which is an ideal state. A simple broaching operation restores the spline dimensions.

This speed is a compromise between a fast speed that would throw salt out of the furnace and a very slow speed which would let the teeth cool when exposed to the air. At 45 rpm the carry-out of salt on the teeth is sufficient to keep the parts at temperature between immersions and protect them from the atmosphere.

There is a definite advantage in the cyanide carburizing bath. The gears pick up some nitro-

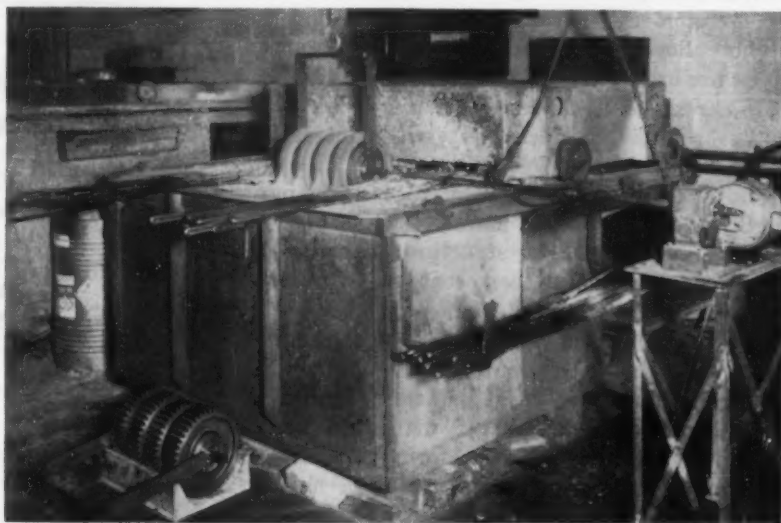


GEARS SHOW uniform hardness (Rc 52) over area treated. Core hardness is Rc 36. Inside diameter shrinks slightly.

gen and carbon resulting in greater wear resistance in service.

The rate of heat treating—four gears in 4 min—is comparable to the fastest methods available commercially. The fixtures could be enlarged to vary the rate. Gears of other sizes can be treated by the same method if different size fixtures are provided. Since the fixtures do not enter the bath, they are not subjected to distortion.

GEARS IN FIXTURE rotate at 40 to 45 rpm in molten salt bath for 4 min. Gears are then quenched and tempered. Hardness is uniform.



# Structural changes SABOTAGE corrosion-resistant LINERS

Corrosion-resistant steels used as a liner material in chemical and petroleum industry apparatus frequently undergoes structural changes which impair the liner's toughness. In choosing a suitable chromium steel, resistance to corrosion, ductility and weldability are important factors in lowering maintenance costs.

By J. H. van Swaal  
Metallurgist  
Koninklijke/  
Shell-Laboratorium  
Amsterdam, Holland



Corrosion-resistant chromium and chromium-nickel steels are often used as liner material in chemical and petroleum industry apparatus. As a result of welding or during service objectionable structural changes such as weld decay, 885°F embrittlement, or sigma phase may occur. These may impair the liner's toughness.

Large apparatus often requires high resistance to corrosion at high pressures and temperatures. For economy they are made of ordinary unalloyed steel protected by a relatively thin lining of corrosion-resistant steel. For these linings the highly alloyed chromium and chromium-nickel steels are used.

In chromium steels resistance to corrosion and notch sensitivity increases with increasing chromium content. Weldability and ductility decrease as the carbon content increases. The most highly alloyed types are mainly used as heat resisting steels. Their structure, greatly dependent upon the carbon content, is ferritic and/or martensitic (Fig. 1).

The  $A_4$  point (transition from delta to gamma) is lower as the chromium content is higher; the  $A_3$  point (transition from gamma to alpha) is raised, causing enclosure of the gamma area. The delta and alpha areas form an entirety, separated from the gamma area by a narrow, looped transition area—gamma, alpha or delta,

respectively. The size of the gamma area is determined by the carbon content.

Though corrosion-resistant chromium steels are used less than chromium-nickel steels in the chemical industry, they are widely used as liners in the petroleum industry. Lower resistance to corrosion, lower ductility, higher notch sensitivity and poorer weldability are disregarded, because they withstand sulfurous mediums ( $\text{SO}_2$ ,  $\text{H}_2\text{S}$ ).

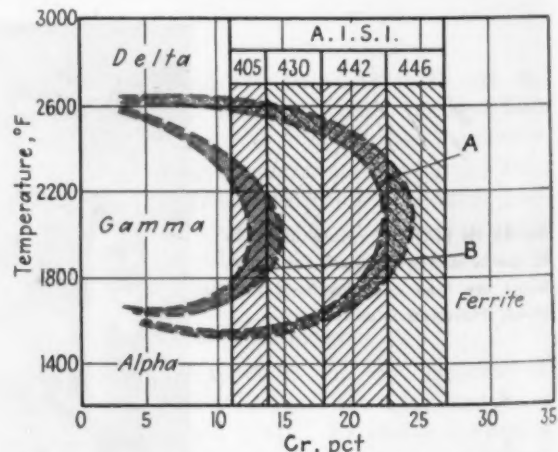


Fig. 1—Position of gamma areas of chromium steels depends on carbon content. A shows gamma plus ferrite at 0.25 pct C. B shows gamma plus ferrite at 0.01 pct C.

In choosing a suitable chromium steel, resistance to corrosion, ductility or weldability, and operating temperatures are important. With increasing chromium content and temperature, the chance of deterioration of ductility as a result of structural changes increases. A decrease in ductility may have fatal effects near room temperature where brittleness is highest, e.g., when operations are started or stopped, and when repairs have to be made.

Up to 1936 type 430, 17 pct Cr, was generally used for liners in the petroleum industry. Working temperatures ranged from 500° to 1000°F. Loss of ductility as a result of dispersion hardening occurred. A change to steel with less chromium, type 410, 11.5 to 13.5 pct Cr, C max. 0.15 pct caused some improvement. Best results were obtained with a modified 405, of the chromium-aluminum or chromium-molybdenum-aluminum type. Its analysis is the following:

C —0.08 pct max	Si —0.5 pct max
Cr—11 to 13 pct	Ni—0.3 pct max
Al—0.2 to 0.3 pct	Mo—0.05 max resp
	0.4 to 0.6 pct
S —0.03 pct max	Cu—0.1 pct max
Mn—0.2 to 0.5 pct	Ti —0.02 pct max
P —0.03 pct max	Nb—0.02 pct max

Corrosion-resistant chromium-nickel steels were originally of the pure austenitic chromium-nickel type. Usual grades were 18-8, 25-20, 15-11 and 12-12 Cr-Ni. Carbon content of all was about 0.16 pct. Compared with chromium steels, they are all more resistant to corrosion and have greater ductility and better weldability. Work hardening by cold-deformation is higher than in ferritic chromium steels and weldability sometimes presents difficulties.

#### Corrosion resistance enhanced

Addition of 1 to 4 pct Mo enhances resistance to corrosion in sulfurous mediums. By adding molybdenum to electrodes some ferrite as well as austenite is formed. This reduces the tendency to root-bead cracking. Addition of molybdenum has a certain stabilizing effect as well.

Moderate and prolonged temperature increases during operation or welding may cause objectionable structural changes. Deterioration of ductility generally follows. One of these conditions is always operative, as all liners are welded. Structural changes owing to high temperature include: Changes resulting from carbide precipitation along the grain boundaries (weld decay); 885°F embrittlement; sigma phase.

Austenitic chromium-nickel steels may, when heated even for a short time to a range of 930° to 1470°F, precipitate carbides rich in chromium along the grain boundaries. These draw chromium essential to their formation from their immediate surroundings without this being sufficiently replenished by diffusion.

The zones from which chromium has been withdrawn (less than 12 pct Cr) around the carbides may merge. The danger of weld decay

along the grain boundaries arises. Critical temperature conditions are present beside every weld and frequently in the weld itself. In corrosion-resistant chromium steels this danger does not exist. The dissolving power of the chromium ferrite towards carbon is slight; thus the carbides are present immediately after solidification and no withdrawal of chromium takes place.

Methods of investigating a steel for liability to weld decay often differ in procedure and interpretation. In principle a sample is annealed, generally to 1200°F, for 10 to 60 min. whereby carbides are precipitated and then boiled in a highly corrosive medium. Presence of intercrystalline attack is determined by microscopic investigation, change in electrical resistance, or change of sound when dropped on a hard surface.

In America, the Huey test is used for detecting weld decay. In Europe, preference is for the method first applied by W. H. Hatfield, better known as the Strauss test.

#### Weld decay may be prevented

Weld decay in austenitic chromium-nickel steels may be prevented by heat treatment, reduction of carbon or addition of elements with greater affinity to carbon than chromium, so that the chromium remains in solution.

By heating the welded sample above about 1920°F precipitated carbides may be redissolved and kept in solution by rapid quenching. This is not always possible in practice. In steels with little or no carbon few carbides will form. Even when melted in suitable induction furnaces it is difficult to reach a carbon content below 0.08 pct in type 304. This method is expensive and not entirely effective.

By adding titanium (at least five times the carbon content; type 321) or columbium (about ten times the carbon content; type 347) carbides with these elements are formed. No withdrawal of chromium takes place along the grain boundaries. Lower carbon contents are preferred in America. Stabilization is less popular and when applied columbium is preferred.

#### Carbide precipitation

When possible, heat treatment is applied after welding unstabilized steels (cheaper) and the risk of stresses is accepted. Stress-relieve annealing causes carbide precipitation again.

In England, stabilization is widely applied, usually with titanium. Views differ on the stabilizing effect of molybdenum in types 316 and 317.

Differences between American and English views are sometimes accounted for by the preference in America for the Huey test and in England for the Hatfield test. The former gives a larger decrease in weight in the steels with a higher carbon content and also in 18/8 stabilized with titanium.

In the case of electrodes, stabilization with



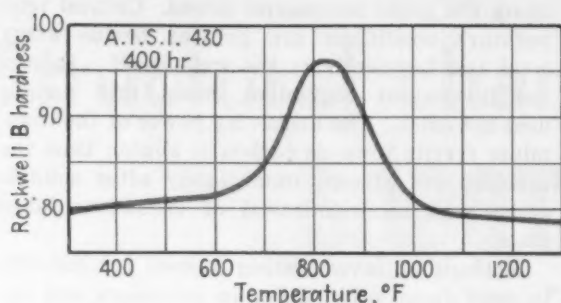


Fig. 2—Hardness curve of AISI 430 is shown during 400 hr annealing at different temperatures.

### Corrosion resistant liners (continued)

columbium is preferred to titanium. During welding titanium burns off badly.

Moreover, at some temperatures columbium gives better creep strength. Its strong ferrite-forming effect—which increases the likelihood of sigma phase formation is compensated by a slightly higher nickel content.

Prolonged exposure of corrosion-resistant chromium steels of more than 15.5 pct Cr to temperatures of 700° to 1000°F causes precipitation hardening and embrittlement.

The change in hardness is plotted against the temperature of annealing in Fig. 2, for type 430. In experiments of Becket no embrittlement below about 20 pct Cr was found, but annealing times were too short. Carbon-free alloys also show more precipitation hardening, as the chromium content is higher. Below about 13 pct Cr there was practically no increase in hardness.

Production of type 430 was started in America in 1925. Pipes made of this steel were built into steam superheaters (temp. 900°F). The pipes were found to lose ductility. Temporarily, ductility could be restored by heating to 1050°F and higher. The effect of 400 hr heating in the critical range (900°F) is shown in table. Deterioration in ductility is particularly apparent in the decrease in elongation and reduction of area.

Precipitation hardening is slow. Below 900°F an appreciable decrease in ductility is not observed until long annealing times are applied. Pipes referred to (see table) after 13,000 hr heating to 885°F exhibited about the same hardness as after 400 hr at 900°F. There had been no decrease in hardness as a result of over-aging. Cold-deformation, however, accelerates precipitation.

X-ray diffraction analysis reveals a deformed crystal lattice, but no sigma-phase formation at 885°F.

Occurrence of 885°F embrittlement is scarcely felt in the microstructure; there are slightly wider grain boundaries and chromium-ferrite crystallites often display fine precipitations.

Stresses causing embrittlement often give Neumann or twin lines in the microscopic structure. Increase in brittleness is accompanied by a decrease in volume.

Many investigators feel 885°F embrittlement must be connected with the occurrence of sigma phase. They view this brittleness as a result of precipitation hardening preceding sigma phase formation. The equilibrium is then shifted in favor of the sigma phase as soon as mobility in the lattice has increased as a result of higher temperatures.

Specially prepared pure iron-chromium alloys, after heating for 1500 hr at 1000° to 1300°F give no sigma phase, yet exhibit 885°F embrittlement.

In pure binary iron-chromium alloys with more than 15 pct Cr, as well as in alloys containing aluminum, vanadium, tungsten, molybdenum, columbium, titanium, manganese and silicon, 885°F embrittlement was observed.

So far no means has been found to prevent or permanently eliminate 885°F embrittlement.

Alloys with 42 to 48 pct by weight of chromium (44-50 atom pct) below about 1380°F consist entirely of sigma phase. On each side of the sigma phase are transition areas where sigma and ferrite occur. The transition area in alloys with less than 42 pct by weight of chromium, at decreasing temperature, bends fairly sharply to lower chromium concentrations, i.e., to the iron-chromium alloys of actual practice. These contain sigma phase beside ferrite.

### Sigma phase forms

Sigma phase forms in corrosion-resistant chromium steels with more than 25 pct Cr after prolonged heating at 1100° to 1300°F. The main constituent of sigma phase is the hard, brittle, nonmagnetic, intermetallic compound iron-chromium with 50 atom pct Cr, with a complicated cubic body-centered lattice. Sigma phase can exist up to about 1500°F and then transforms to ferrite (Fig. 3).

Since equilibrium is established slowly between the alpha and sigma phase, the boundaries of the transition area in the iron-chromium dia-

### PHYSICAL PROPERTIES OF 430 STAINLESS

Property	AISI Type 430 (17 pct Cr)	
	Heated 4 hr to 1500° F	Heated 4 hr to 1500° F—400 hr to 900° F
Tensile strength, psi	66000	82000
Yield point, psi	42000	73000
Elongation on 2 in. (pct)	37	2.3
Reduction of area (pct)	71	1.3
Hardness (RB)	79	92.5
Impact value (Charpy)	1.5	0-0.5

\* H. D. Newell.

gram are only vaguely known. Various investigators give them differently according to concentration and temperature.

In the chromium-nickel steels sigma phase can form in a temperature range of 1100° to 1800°F. Sigma phase here differs more from the composition FeCr, and by the addition of nickel, molybdenum, silicon, vanadium, manganese and aluminum may form complex crystal phases with these elements. Sigma phase formation is possible from the alpha, and the gamma phases and, according to some authors, even from the carbides.

#### Elements conducive to sigma formation

The principal part of the ternary Fe-Cr-Ni diagram according to Schafmeister and Ergang has been described in *Archiv fur das Eisenhüttenwesen* 12, No. 9, Mar., 1939.

Of the important chromium-nickel alloys 18/8 and 25/20, are close to the composition where sigma is present as the stable phase. Alloy 25/12 even has the gamma-sigma structure and the alloy 15/35 has a homogeneous gamma structure. A small addition of elements conducive to sigma formation, such as molybdenum, silicon, aluminum, columbium or titanium to 18/8 and 25/20 is sufficient to cause the sigma phase to make its appearance here, too.

#### Mechanical properties shown

Mechanical properties of an 18/8/3 titanium steel are shown in Fig. 4. Ferrite content, hardness, impact value, angle of bending and loss in weight in 25 pct H<sub>2</sub>SO<sub>4</sub> of 104°F are shown as functions of the temperature. The samples were quenched from 2100°F and annealed for 4 hr at 930° to 2010°F.

X-ray diffraction analysis clearly shows austenite and ferrite lines after quenching from 2100°F in water, and austenite and sigma lines after annealing to 1560°F.

Compound steel, the combination of mild steel and corrosion-resistant steel (clad steel) can be manufactured in several ways. These include:

- (1) Rolling two compound blocks with liners

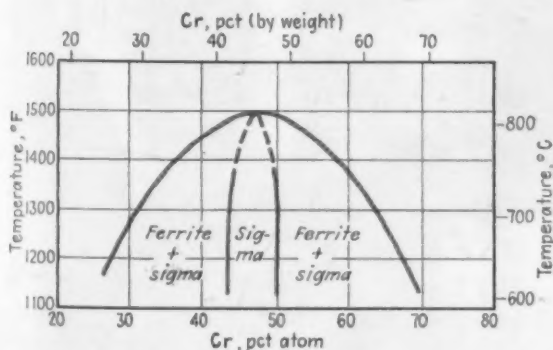


Fig. 3—Ferrite and sigma occur on each side of sigma phase as Cr content varies. (Cook and Jones)

tack-welded to the blocks. Liners, separated by an infusible material, face each other on the inside of the blocks. The entire section is rolled "sandwich" style.

- (2) By casting mild steel around two liner layers and then rolling.

- (3) By fusing the clad layer to mild steel and rolling.

- (4) Building up a clad layer by arc-welding, then machining and rolling.

- (5) Attaching the liner by spotwelding.

The liner should lie well up against the mild steel. Space between the two causes poor heat transfer. Also, as a result of incidental damage, gas pressure may get behind the liner and loosen it.

In apparatus in which operations are slowly started and stopped, no damage to the liner need be expected if the coefficients of expansion of the liner material and the mild steel do not differ greatly. In this respect a chromium steel liner may offer advantages over an 18/8 type liner.

#### Regular liner inspections necessary

In most apparatus, however, even when materials have the same coefficients of expansion, loosening may be caused by sudden and uneven expansion and shrinkage. Careful and regular liner inspections are necessary.

It is important that repairs be made properly. The chamber walls must thoroughly cleaned, preferably by sand- or shot-blasting.

Damaged pieces of liner must be removed, generally by melting off with a mild steel electrode using high current. Cracks must be cut away, ground or melted out. New patches of lining have to be put in, generally as strips about 4 in. x 8 ft and welded against the chamber wall either with two or with three beads.

Plug welding is more complicated and expensive. The strips are as wide as 24 in. A length of 72 in. for horizontal, and 120 in. for vertical application is generally specified. Strips have punched or drilled holes, 1/2 to 1 in. diam, with a pitch of about 3 to 4 1/2 in. according to working temperature. The plug welds are first welded round the edges and then the center is filled in.

#### Welds should not overlap

Overlapping welds are not recommended as they cover part of the weld, preventing inspection. The best compromise between economy and practicability of welding is a liner thickness of 5/64 in., unless extra corrosion allowance is required.

Electrode composition should be balanced to avoid sigma phase, root-bead cracking or weld decay. Generally, high alloy electrodes, 25/20, give lower hardness in the fusion zone than the 18/8 type. They are, however, more susceptible

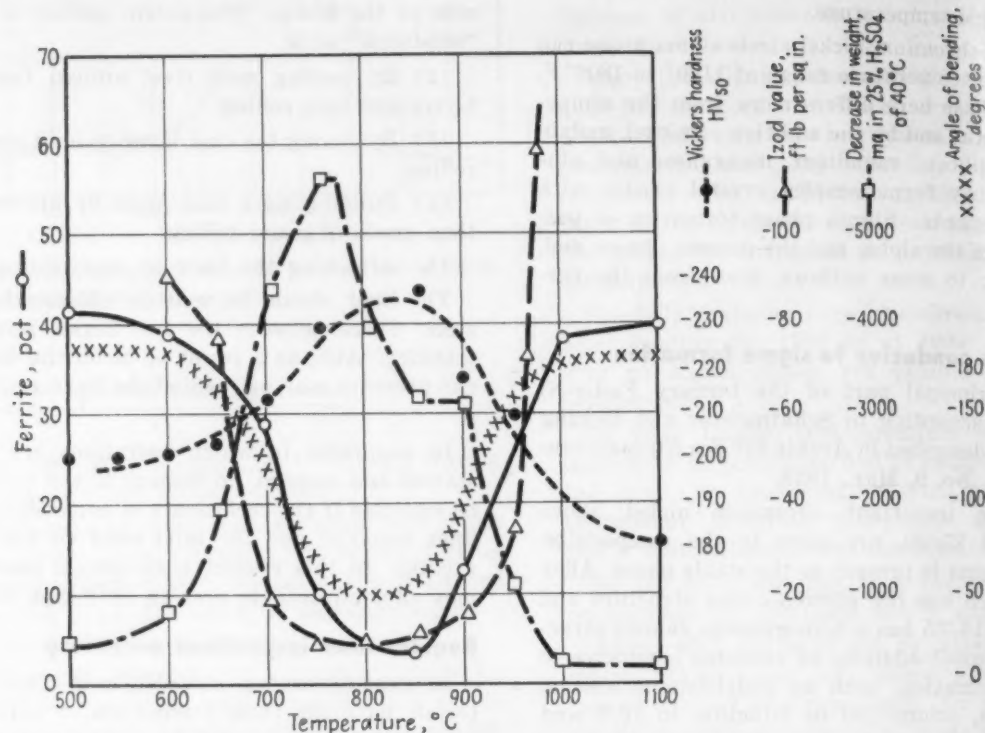


Fig. 4—Chart shows relation between mechanical properties and annealing temperatures of an 18/8/3 titanium steel heated to 2100°F, quenched in water, then heated for 4 hr to varying temperature ranges.

to cracking. Type 316 has best welding properties and least crater cracks.

For adequate penetration electrodes should be  $\frac{1}{8}$  in. thick. Forcing the strips firmly against the chamber wall is better than tack-welding.

Generally the two-run method of welding is preferred.

For less distortion of the strip, welding is carried out gradually from the middle to the free ends or from one end to the other.

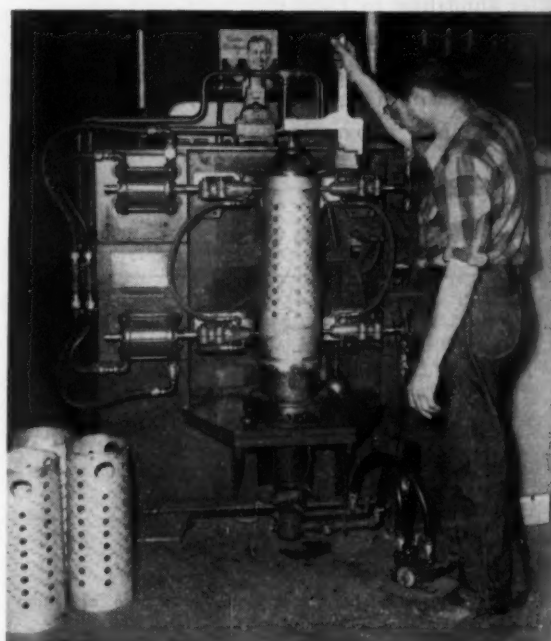
## Single Machine Assemblies and Spotwelds

One of the most specialized welding machines ever devised has recently been installed at Ryan Aeronautical Co. for use in production of jet engine components. Designed by the Thomson Welding Machine Co., it is tailored to perform a unique operation on a Ryan jet component. It makes four simultaneous spotwelds.

Described as a post spot-tacking machine, this unusual tool serves as both an assembly and fabrication machine in the manufacture of inner combustion chambers for the J-47 jet engine. It quickly aligns the three major parts of the combustion chamber and spot-tacks them together prior to seam welding.

One machine operator can assemble the combustion chambers five times as fast as two employees could formerly accomplish the work.

ASSEMBLY and spotwelding are accomplished simultaneously in this Thomson machine at Ryan Aeronautical Co. The part is a J-47 jet engine inner combustion chamber.





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Continued

### Air friction clutch

Operating and maintenance costs go down where Press-Rite Airflex air friction clutch is used, according to a new folder. Features of the clutch include: No adjustment for wear, air and spring safety brake, regulation of air pressure to suit the type of work, no excess heat, air or electric controls, hand or foot operation. *Sales Service Machine Tool Co.*

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### Solderless terminals

A new 78-p. technical data catalog of interest to electrical engineers and wire foremen tells by case studies the time and labor which may be saved by using solderless terminals. The story of the AMP pressure crimp is augmented by test curves showing terminal performance under varying conditions. *Aircraft-Marine Products, Inc.*

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### Excavator catalog

Latest advancements made on the Koehring Model 304 excavator are described in an attractive 2-color booklet. The story of design, construction, work capacity and application of the heavy-duty excavator is told with many illustrations and drawings. *Koehring Co.*

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### Combustion equipment

A new and comprehensive bulletin describes the complete line of McKee-Eclipse burners, mixers, valves and blowers used in gas combustion for industrial purposes. The pamphlet is designed to show the variety and range of products available. *Eclipse Fuel Engineering Co.*

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### Rotameters

Brooks rotameters, designed to meet every known purge meter requirement, range from the Brooks-Mite for small flow indication of liquids or gases to high capacity, high pressure meters. These, and research and test models are described in a new bulletin. *Brooks Rotameter Co.*

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# NEW equipment

New and improved production ideas, equipment, services and methods described here offer production economies . . . fill in and mail postcard on page 149 or 150.



## Copying lathe uses carbide or diamond tools

A new high speed hydraulic copying or profiling lathe built in France by H. Ernault-Batignolles Machine Tool Div. of Batignolles-Chatillon Locomotive Co. has its copying device integral with the machine. Vibration is eliminated even at its top spindle speed of 3600 rpm, giving maximum output from carbide and diamond tools.

It can copy to within  $\pm 0.0004$  in. on diameter. Copy turns from flat template or turned master. Workpiece with numerous different diameters, tapers chamfers, etc., are copy-turned with a single tool, in one continuous cut. The machine can also be used as an ordinary center lathe with adjustments.

*H. E. B. Machine Tools, Inc.*

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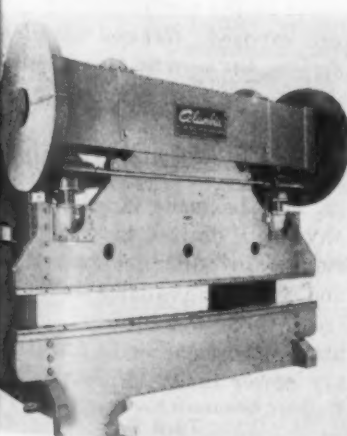


## Low cost machine saws, files and polishes

A 16-in. throat x 12-in. thickness capacity light duty bandsawing-filing-polishing machine provides both high and low tool speed ranges, without changing belts, pulleys or motors. Speed is infinitely variable by handwheel control and two-speed geared transmission from 50 to 300 fpm and from 860 to 5200 fpm. It is an adaptable machine

capable of conventional metal sawing, high speed nonferrous sawing and light gage friction sawing. A saw band welder makes it possible to make internal cutouts such as die openings and to reproduce special tools and machine parts. Job selector dial and Speedmaster drive are included. *DoAll Co.*

For more data insert No. 21 on postcard p. 149



## Power press brake line expanded, improved

Expansion of Columbia's power press brake line includes a complete range of sizes from 120 to 1000 tons capacity for forming mild steel from 3/16 to 1 in. thick, 6 to 20 ft long. Numerous design improvements have been incorporated in all models, those of 350 tons capacity and larger having been largely redesigned. A new wedge-type ram pressure release has been developed for releasing the ram in event of bottoming of the dies. A

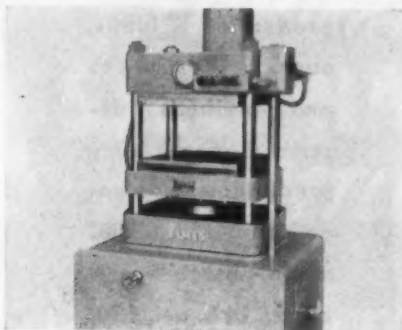
two-speed transmission affords approximately 4:1 speed ratio and smaller models can be similarly equipped on order. Special throat depth, stroke and shunt height can be furnished and all models can be equipped with air counterbalances and air-operated clutches, solenoid-actuated. *Columbia Machinery & Engineering Corp.*

For more data insert No. 22 on postcard p. 149

Turn Page



## New Equipment

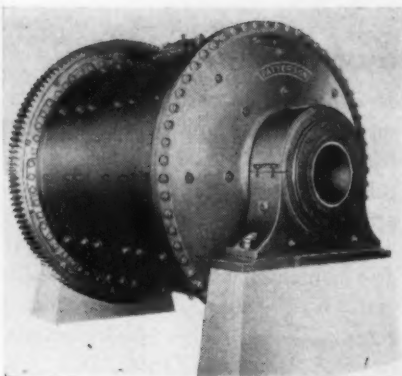


### Fifty-ton Hydrolair has electrical control

Hydrolairs are small, lightweight, inexpensive plastic molding presses, designed and constructed on a hydraulic principle that is said to greatly reduce production costs. These presses take their power entirely from the shop air line. They are fast and full power-operated, with continuous high-pressure stroke, yet without the usual mo-

tors and pumps. The pressure selected is automatically applied and maintained, even on compressible materials. Hydrolairs are compact, quiet, easily installed and moved. They are supplied as complete packages with nothing to buy. *Elmes Engineering Co. American Steel Foundries.*

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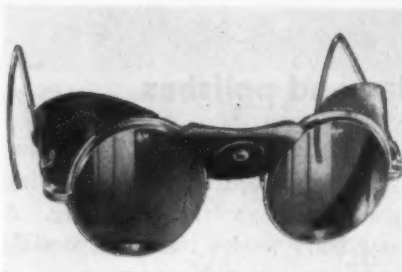


### New mill insures reliable continuous grinding

A new heavy duty continuous ball or tube mill has improved mechanical features that insure economical and reliable continuous grinding operation under the most severe conditions, with costly shutdowns being eliminated and maintenance expense reduced to a minimum. Adaptable to fine or coarse, wet or dry, open or closed circuit grinding, the continuous mill may be used for pulverizing chemical and

ceramic raw materials, and minerals. It may be used to deliver a finished product or may be operated in conjunction with Patterson classifying equipment of various types. Hollow trunnions provide continuous feed and discharge of materials. Mill size range from 2 ft diam x 2 ft long to 10 ft diam x 24 ft long. *Patterson Foundry & Machine Co.*

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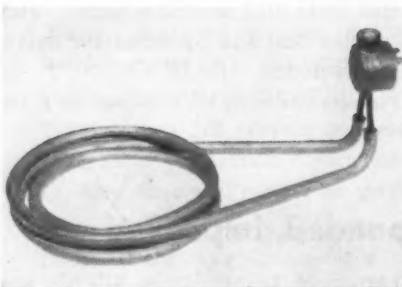


### Welder's goggle has removable side shields

Featuring removable and adjustable binder-type leather side shields the new goggle can be adjusted for perfect fit and maximum comfort by loosening the endpiece screws. By removing the screws, the side shields can be taken off for clean-

ing, sterilizing or replacing. Side shields are soft leather, providing greater comfort and increased protection against heat, harmful light and flying particles. *American Optical Co.*

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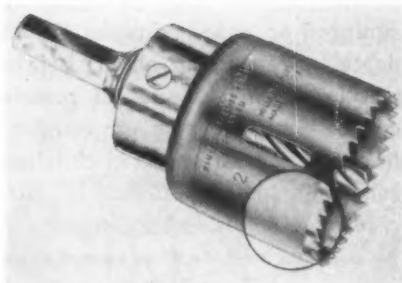


### GE redesigns two Calrod immersion heaters

Greater flexibility and portability have been incorporated in the two Calrod immersion heaters by replacing the old-style sealing cup with a new junction-box of terminal housing which is vapor tight. The terminal housing is easier to repair in the field, and relocation

of the unit is more quickly accomplished. The housing reduces the possibility of faulty connections and the terminals are readily accessible by removing the housing cover so the connectors to the leads are exposed. *General Electric Co.*

For more data insert No. 26 on postcard p.



### Follow-thru hole saws cut machinable material

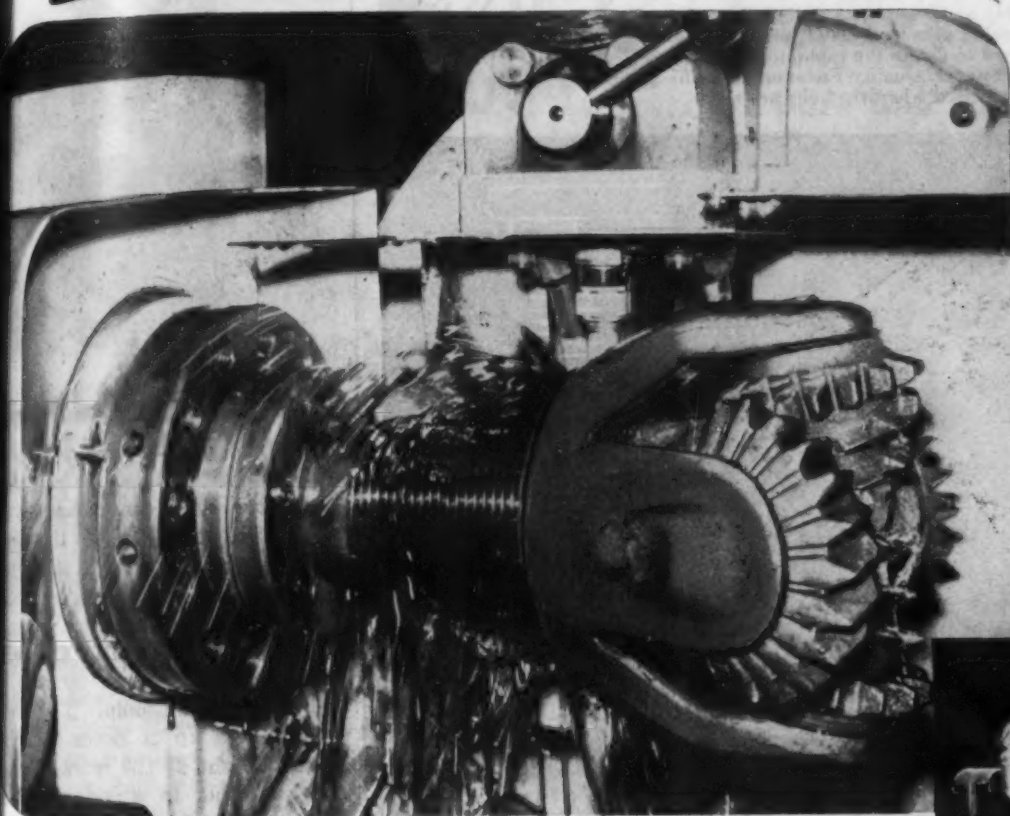
Blu-Mol high speed, heavy duty, follow-thru type hole saws feature a specially selected high-speed steel edge welded to tough alloy steel back. The result is a blade capable of cutting any machinable material and yet practically unbreakable in use. Cuts up to 1 1/8

in. may be made in solid stock, to any depth desired in stacked material or in cutting thru partitions and walls. Available in 40 sizes from 5/8 to 4 1/2 in. diam, they are used in portable drills and stationary power tools. *Millers Falls Co.*

For more data insert No. 27 on postcard p.

Turn Page

# **FACTS** on improving production!



*Photos courtesy The Reed Roller Bit Co.*

## **4 inch diameter, 4 pitch API Threads ground from the solid in one pass of the wheel**



The Reed Roller Bit Company's first concern is to maintain the highest possible quality in their products. They place special emphasis upon the development of improved manufacturing methods. A notable instance is their increased use of Jones & Lamson Automatic Thread Grinders.

*These machines, in the skilled hands of Reed men trained in their operation, are helping to turn out better products for the drilling industry.*

In addition to better quality threads and more uniform finish J&L Automatic Thread Grinders:

- reduce handling costs
- eliminate costly rethreading after heat treatment
- eliminate expensive retooling when specifications change
- reduce the cost of gage maintenance

Now, more than ever, the most efficient machines and methods are needed to make the most of your available manpower and material. Jones & Lamson engineers are available to help you with your turning, threading and inspection problems. Write today to Department 710.

**Turret Lathes—Fay Automatic Lathes—Thread  
Grinders—Optical Comparators—Threading Dies**

# **JONES & LAMSON**

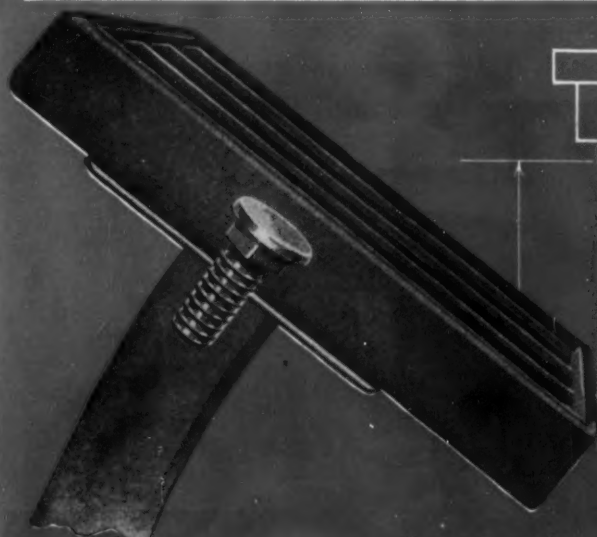


**MACHINE COMPANY**  
Springfield, Vermont, U.S.A.

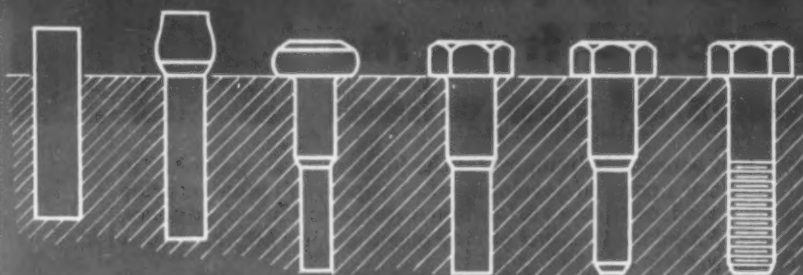
**Machine Tool Craftsmen Since 1835**

## STANDING BEHIND EVERY STOP...

You will probably never see this small **®** Special. Yet many discerning eyes have seen...and many skilled hands have helped to create the reputation standing behind this **®** Fastener. Quality Fasteners with the **®** on the head are recognized wherever bolts are used.



**A SPECIAL **®** FASTENER**  
made with **DIMENSION CONTROL** and  
**UNIFORM HIGH STRENGTH**



Steps in the "Double Extrusion" Process

The production of this Brake Pedal Bolt represents the latest in cold-heading techniques. The strength of the bolt is actually increased during the fabricating processes. Even the threading is done without breaking the "skin" of the metal. Best of all, the economy that is effected by modern methods makes possible a wider use of bolts "designed to fit the job".



## BUFFALO BOLT COMPANY

Division of Buffalo-Eclipse Corporation

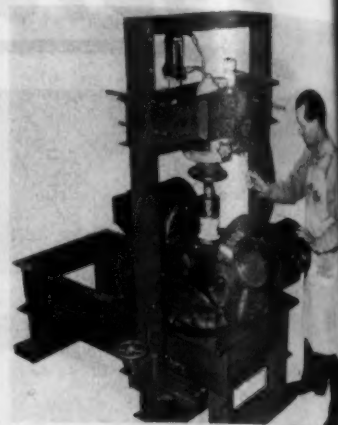
NORTH TONAWANDA, NEW YORK

Sales Offices in Principal Cities. Export Sales Office:  
Buffalo International Corp., 50 Church Street, New York City

**Our Specialty is "SOMETHING SPECIAL"**

## New Equipment

Continued



### Handles awkward parts

The Dake movable frame press is provided with a large area table on which the work can be lowered by hoist or crane. Then the press frame is moved over the table. The workhead can be moved from side to side along the frame channel making it easy to center the work head above the work laterally as well as longitudinally. The work head moves up or down to adjust to the height of the work. Presses are available in standard capacities of 25, 50, 75, and 125 tons. They can be furnished for either electric or air-powered hydraulic operation. *Dake Engine Co.*

For more data insert No. 28 on postcard p. 16

### Massive knife grinder

An extra-heavy duty knife grinder of massive, new proportions is designed to precision grind doctor blades, paper knives, heavy duty chipper knives and shear blades up to 210 in. long. It also is adaptable for flat faces and straight edges. The cabinet base is 30 ft long and the whole machine weighs 10½ tons. Knife bar and table travels over 5-in.-wide precision machined V ways. Variable speed motor drives the table assembly at speeds from 25 to 50 fpm. The grinding head is automatically fed to the work by a heavy worm gear over machined ways. A 15-hp motor drives the 20-in. diam segmental grinding wheel. *Samuel C. Rogers & Co.*

For more data insert No. 29 on postcard p. 16



## New Equipment

Continued

### Steel chutes

Standard steel chutes, manufactured in lengths of 6, 8, 10 and 12 ft and widths from 6 to 36 in. in increments of 6 in. speed up the handling of bulk and packaged materials at low cost. These chutes are formed in one piece from heavy gauge steel with sides 6 in. high. An adjustable tripod stand is usually used at one end to adjust height to individual requirements. Sage Equipment Co.

For more data insert No. 30 on postcard p. 149

### Caulking guns

A new line of caulking guns are designed for use with new Rub-Bub chromated caulk. The two models use bulk caulk or caulk cartridges and feature contoured handles, positive ratchet drive, long trigger stroke and instant pressure release. Their small size permits access to confined spaces. Samuel Moore Chemical Co., Inc.

For more data insert No. 31 on postcard p. 149

### Arc welder

Efficient and economical operation is a feature of a new portable arc welder. It has a welding range of 20 to 80 amp, with a reserve sometimes needed for the exceptionally tough job. Model 80A takes 1/16 to 1/8 in. rods on work ranging from 24 gage to 1/4 in. sheet metal. Engineering features incorporate nine heat stages adaptable to either arc welding process or the twin carbon torch method. Trindle Products, Ltd.

For more data insert No. 32 on postcard p. 149



Turn Page

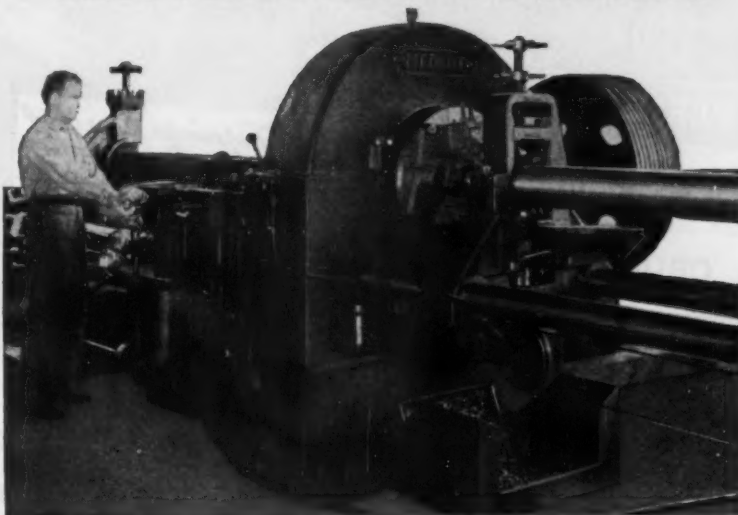
## Fully Automatic Centerless Turning & Peeling!

... for bars and tubes from  
1" to 9" diameter, and larger



MODEL RFRG

### CENTERLESS TURNER

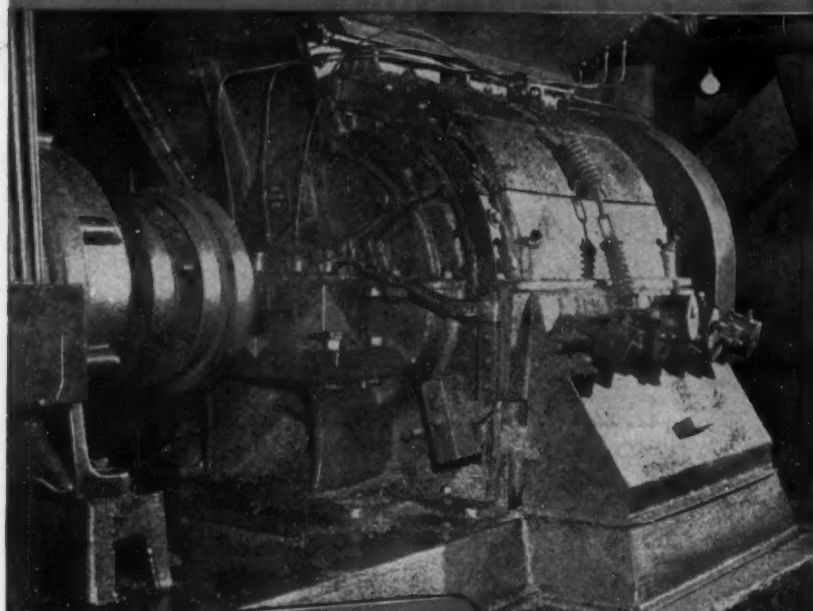


- For high production superior finish, close-tolerance turning or rough peeling. Workpiece size and throughput speeds are limited only by capacity of cutting tools.
- New direct-drive roll-feed with patented Universal Centering Device insures continuous, positive feed and automatic centering of workpiece in cutterhead.
- Separate variable drives for feed and cutterhead give exact ratios between cutter speeds and bar feeds.
- Either 1 or 2 removable cutterheads may be used, with from 1 to 10 cutters for maximum cutting flexibility. Either carbide or high-speed tools are used.
- Eliminates time lost in loading and unloading. Automatic input and output grip carriages permit constant end-to-end feed and delivery.
- Fully automatic push button control from central operating station.

Write For Illustrated Brochure

THE MEDART COMPANY 3535 DE KALB STREET  
ST. LOUIS 18, MISSOURI

# *Automobile Manufacturer Reports...* **\$36,000 EXTRA YEARLY PROFIT** with this **AMERICAN** METAL **TURNINGS CRUSHER**



## **PERFORMANCE DATA**

**PROBLEM** *To Reduce Metal Turnings received from engine and axle plants*

**CRUSHER INSTALLATION** *American \$3800 Crusher*

**AGE** *In active use 22 years*

**YEARLY TONNAGE** *9,000 tons steel turnings per year*

**PARTS COST PER TON** *Only \$.0153 per Ton!*

With shovelling chips bringing an average of \$4.00 more per ton than machine turnings, this case history of a well-known automobile manufacturer represents an additional gross profit of \$36,000.00 per year—with an average yearly parts cost of only \$135.00.

There are other significant savings, too. American-reduced chips yield up to 50 gallons of recovered cutting oil per ton... require less storage space... are much easier to handle.

There can be no better proof of the profit possibilities and the high-quality construction of AMERICAN Rolling-Ring Metal-Turnings CRUSHERS.



WRITE for Bulletin on Metal Turnings Crusher

**American**  
 Originators and Manufacturers of  
 Ring Crushers and Pulverizers

1439 MACKLIND AVE.  
 ST. LOUIS 10, MO.

## **New Equipment** *Continued*



## **Wire stripping**

A high speed wire stripper has special alloy steel circular cutting knives which instantly and completely remove insulation from solid, stranded or multi-conductor cable up to 1/2 in. diam, and the stripping length is adjustable up to 1 1/2 in. Its 1/4 hp 110 v direct connected motor comes complete with cord, switch and plug ready for any convenient outlet. It is fast and foolproof in operation, with speed adjustments and inexpensive replacement knives. High Speed Hammer Co. Inc.

For more data insert No. 33 on postcard p. 149

## **Joint pliers**

Extra strength is claimed for forged rib-joint pliers due to the ribbed joint being full forged. The joint itself and the ribs are the critical parts most likely to break under hard usage. Members are formed in the forging process; no machining is used. Utica Drop Forge & Tool Corp.

For more data insert No. 34 on postcard p. 149

## **Synchronous motors**

A small synchronous motor, operating on the reluctance principle, has no brushes, slip rings, rotating coils or permanent magnet. It can be built to operate continuously at any voltage below 250 v, either single phase or polyphase, and should interest designers of control systems, instrumentation, and military and industrial equipment. Allis-Chalmers Mfg. Co.

For more data insert No. 35 on postcard p. 149

## New Equipment

Continued

### Vane type rotary pump

New heavy duty, rotary pumps are positive displacement, sliding vane type in which the pressure of the liquid being pumped maintains contact of the vanes against the inner. Pumps come in internal and external bearing design; the external bearing models being especially suited for non-lubricating liquids. Pumps are manufactured with built-in relief valve, in standard fitted, bronze fitted or in all bronze construction. **Worthington Pump & Machinery Corp.**

For more data insert No. 36 on postcard p. 149

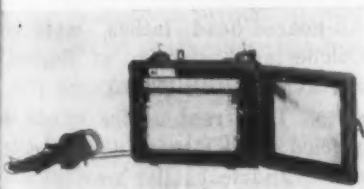
### Steel motor rings

Steel rings with pressed lock joints permit press fit assemblies for electric motors. Specially built hydraulic equipment is used to form the rings, insuring unusually close tolerances, while permitting complete clean-up without necessity of excessive machining. Rings are lightweight. **Wenthe-Davidson Engineering Co.**

For more data insert No. 37 on postcard p. 149

### Permanently records

Measuring and recording alternating current without breaking the circuit is possible with a new, trouble-shooting combination of recording ammeter used portably with a clamp-ammeter unit. The



combination can cover all operations within a power, manufacturing, or processing plant as an aid in preventing wasted power, time, labor and money. The clamp unit can make rapid ac measurements on insulated or non-insulated conductors. It functions on the magnetic induction principle. **Tagliabue Instruments Div. Western Electrical Instrument Corp.**

For more data insert No. 38 on postcard p. 149

Turn Page

November 8, 1951

Superior Forgings at 1/3 the Cost . . .

**SPEED CLEANED WITH**

**WHEELABRATOR®**



Notice the gleaming finish of the forgings after Wheelabrator. Wheelabrator makes plating easier, faster, better, by cleaning forgings down to virgin metal.

Wheelabrator Tumblast slashes costs 70%, cleaning tool forgings at  
**LECTROLITE CORPORATION**  
DEFIANCE, OHIO  
Pays for itself in two years

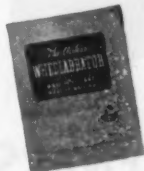
In thousands of installations, the Wheelabrator method of airless blast cleaning has proved itself to be a profitable investment. At the Lectrolite Corporation, for example, a Wheelabrator Tumblast slashed the costs of cleaning tool forgings 65 to 70%. It replaced two blast barrels and a tumbling mill and produced twice as many forgings in less than one-half the time. Forgings are cleaner, making chromium plating easier and more durable without the necessity of subsequent surface treatment. Investigate the cost cutting performance, high - speed production and bonus benefits of the Wheelabrator. Write for the new catalog described below.

#### COMPARE THESE FIGURES

FORMER METHOD	WHEELABRATOR METHOD
<b>EQUIPMENT</b>	<b>EQUIPMENT</b>
2 Blast Barrels 1 Tumbling Mill	36" x 42" Wheelabrator Tumblast (11 1/2 cu. ft. capacity)
<b>PRODUCTION</b>	<b>PRODUCTION</b>
9 to 10 tons in 16 hrs.	14 to 15 tons in 8 hrs.
<b>LABOR</b>	<b>LABOR</b>
32 man hours	16 man hours

#### SAVINGS

Cost figures prove that Wheelabrator cut costs 65 to 75%. Repays investment in two years.



New, informative book gives complete, concise information on all phases of airless blast cleaning. Write today for Catalog No. 74-A.



**American**

WHEELABRATOR & EQUIPMENT CORP.  
510 S. Byrkit St., Mishawaka 3, Indiana

WORLD'S LARGEST SUPPLIER OF AIRLESS BLAST EQUIPMENT

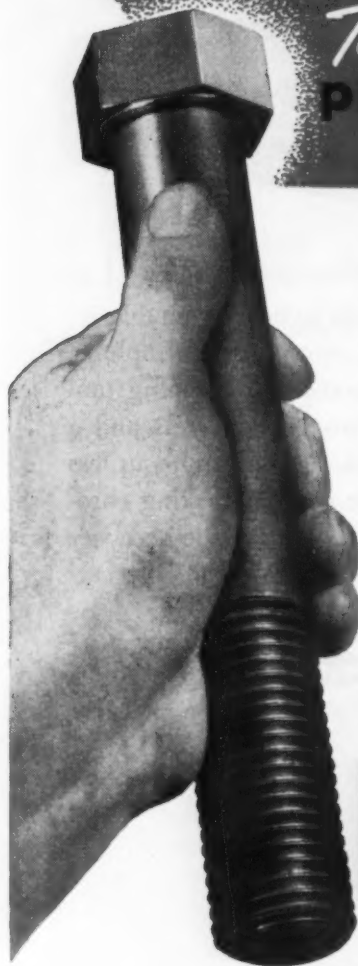


# Unusually Large Cap Screws—

(usually hard to find)

are regular  
**CLEVELAND**

*Top Quality*  
production



For many years Cleveland has catalogued "larger than usually listed" sizes of hex head Cap Screws—stocks a fair assortment whenever possible—makes for you whatever you need up to 2½" diameter, lengths to 36". Also Set Screws to 1½" x 10". Clean, well-made screws, bright or heat treated. Write for sizes and prices.

**THE CLEVELAND CAP SCREW CO.**

2917 East 79th Street, Cleveland 4, Ohio

Cleveland's standard line includes hex, flat, socket and fillister head Cap Screws; Milled Studs and Set Screws.



Warehouses: Chicago, Philadelphia, New York, Providence

**CLEVELAND** *Top Quality* **FASTENERS**



originators of the Kaufman **DOUBLE EXTRUSION** Process

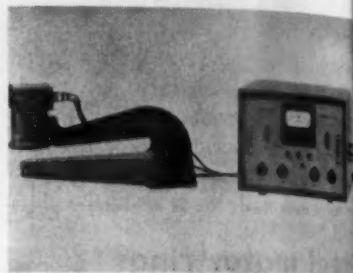
Ask your jobber for Cleveland Fasteners

## New Equipment

Continued

### Beta gages

Two new model absorption and backscatter beta gages for the low cost determination of the weight per unit area of sheet materials incorporate improvements making them more suitable to industrial



use. Absorption beta gages, basically, determine weight changes in sheet material—paper, plastics, rubber, thin metal sheets—by means of a small beam of beta rays that passes through the sheet. Beta gages are unaffected by speed of the moving web, do not contact the material being gaged, may be installed in any location on the machine, and the meters or recorders may be placed at a distance. Backscatter beta gages offer advantages for many installations because they are mounted on one side of the sheet only. *Tracerlab, Inc.*

For more data insert No. 39 on postcard p. 149

### Geared head lathes

All-geared-head lathes, made by Colchester Lathe Co. of England, are available in 13, 15, and 17-in. sizes. The front of the spindle is carried on SKF machine tool double row cylindrical roller bearings with a combined thrust and radial bearing at the rear end forming an extremely rigid spindle layout. Cutting thrust is taken by a precision ball thrust race. Feed and screw cutting controls are interlocked to prevent simultaneous engagement. Saddle is American wing type and standard toolpost is American boat pattern. The loosehead has large diameter spindle and screw. Self-contained motor drive is lever-controlled. *British Industries Corp.*

For more data insert No. 40 on postcard p. 149

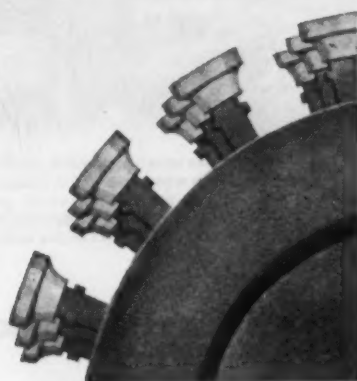
Turn Page

# MAGNESIUM

## and the SALEABILITY



*of your product*

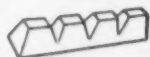


Competition is a great American institution to the consumer—but at times it plays havoc with your sales department. The simple solution, of course, is “build a better mousetrap.” And it may be just that simple when you use magnesium.

The many inherent advantages of this ultra-light metal become sales advantages for you. In many cases great savings in weight through increased use of magnesium has made possible numerous design improvements and the addition of extra sales features. Also, consider the psychological effect a lightweight product has over a heavier one—even when the weight is of no functional

importance! With but a few obvious exceptions, anything that has to be moved or lifted will gain consumer acceptance quicker, if it's lighter. Many of the country's more progressive manufacturers have already found that magnesium permits better design, better performance . . . hence, a more saleable product.

So if you are making, or contemplate making anything in which light weight is important—or if you are just bent on beating competition—plan with magnesium. It has already made many products better, more versatile, easier to handle, more profitable to sell . . . it may improve yours.



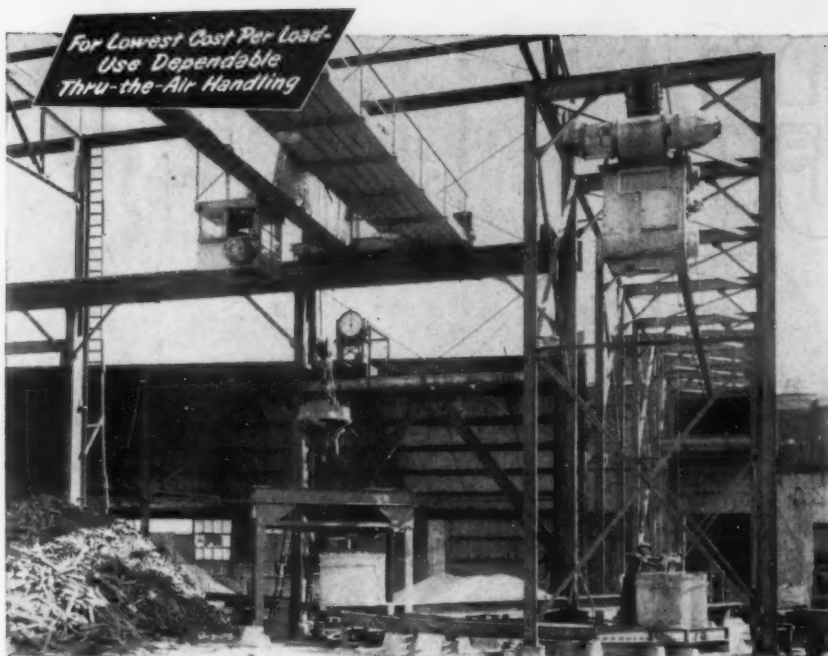
### *This Little “Pig” Was Drafted . . .*

Today, magnesium like many other metals, is a tremendously important part of our defense effort, particularly where light weight is a specification in design. As a result, the supply for commercial uses is often limited. But “tomorrow,” magnesium promises new horizons in the field of metal supply. The seas, at our own shores, can provide 100 million tons per year for a million years without significantly reducing the supply!

**THE DOW CHEMICAL COMPANY**  
Magnesium Department • Midland, Michigan

New York • Boston • Philadelphia • Atlanta • Cleveland • Detroit • Chicago • St. Louis • Houston  
San Francisco • Los Angeles • Seattle • Dow Chemical of Canada, Limited, Toronto, Canada





Shepard Niles weather-proofed, double-monorail cupola charger, teams up with a 5-ton Shepard Niles weather-proofed, magnet-handling crane and Shepard Niles bottom-dump cupola buckets to speed operations and reduce handling costs at a large mid-western foundry. Notice that crane operator has unobstructed view of scale, assuring accurate control of proper amounts of pig and scrap iron.

## we start by asking "what"

WHAT are *your* problems? Under WHAT conditions will *your* crane or monorail hoist be operated—intermittently, or under fairly constant conditions? WHAT are the operating speeds necessary to meet *your* productive cycle?

Answers to these and similar questions made it possible for Shepard Niles to provide efficient, dependable service, plus extremely low maintenance costs—giving this mid-western foundry the lowest handling cost per load for years to come.

Be sure you get the equipment best qualified to do *your* job. It's wise—and costs you nothing—to get the facts first, rather than to make expensive changes later.

May we place our experience of a great many years of successfully designing all types of crane installations at your disposal?

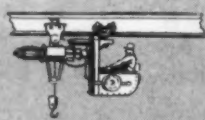
# Shepard Niles

CRANE & HOIST CORPORATION

Makes and sells all three lifting tools for airborne shop loads



CRANES • Overhead



HOISTS • Cab Operated



HOISTS • Floor Operated

356 SCHUYLER AVENUE • MONTAUR FALLS, N. Y.

## New Equipment

Continued

### Roof ventilator

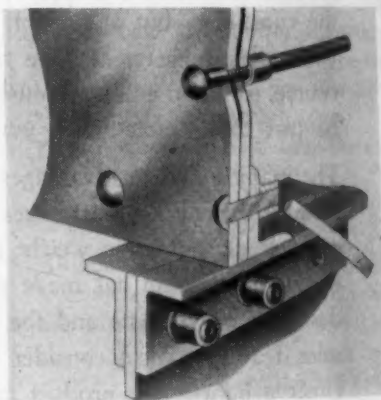
Of the straight-through type, a new powered roof ventilator features simplified design and low overall height without sacrificing efficiency. The ventilator is open only when its propeller fan is operating, the air stream being utilized to open and hold two semi-circular halves of the damper while forcing unwanted elements out of the building. Tradenamed Whirlout, the unit comes in a wide range of sizes and capacities. *Swartwout Co.*

For more data insert No. 41 on postcard p. 149

### Spring computer

Problems of spring design are quickly and easily solved with the Calcuaide spring computer. The computer correlates, in one setting, all the variables in spring design: OD of the spring, wire size in diameter and gage number, number of active coils, material and its torsional Modulus G, maximum shear stress, load and total deflection. *American Hydromath Corp.*

For more data insert No. 42 on postcard p. 149



### Lock bolts

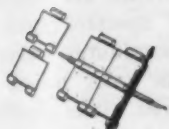
New lock bolts are high strength, two-piece fasteners, consisting of a pin and a collar. The pin is inserted in the work from one side, and the collar slipped onto the pin from the opposite side. A special pneumatic tool installs the lock bolt. Made in two series, aircraft and commercial, of aluminum or steel. Clamping action will pull together a 1/4-in. gap between sheets. *Cherry Rivet Co.*

For more data insert No. 43 on postcard p. 149



# MAY-FRAN

## HINGED-STEEL BELT...



... mechanizes removal of highly destructive sharp-edged cut scrap from a line of punch presses. Assembled from heavy-gauge hinged-steel links, this sturdy belt withstands the extreme wear caused by sheet steel scrap which rapidly disintegrates ordinary belting.

Precision formed, heavy-gauge hinged-steel links are assembled with high-carbon rods. Side chains become an integral part of the belt. Outside links

incorporate interlocking wings which remain positively engaged at all times. Special link and rod design, in conjunction with side wings, eliminates fall-through of materials handled.

MAY-FRAN hinged-steel belting can be assembled from stocked component parts in widths from 6 inches to 6 feet and in almost any length to meet specific requirements. It is available in 2½, 4, 6, 9 and 12-inch pitch length sizes with links solid or perforated to permit the passage of coolants.

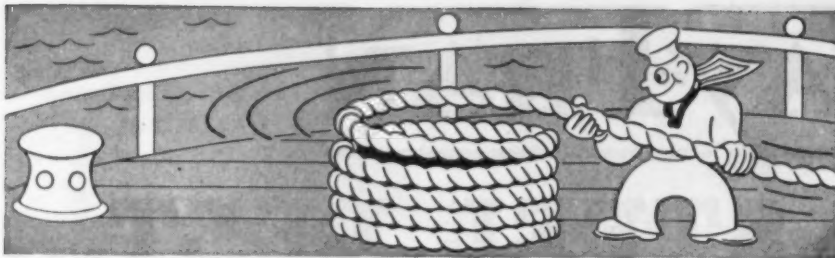
MAY-FRAN hinged-steel belt is shown removing steel scrap from a battery of punch presses in The Midland Steel Products Co. plant in Cleveland, Ohio.

WRITE FOR CATALOG



**MAY-FRAN**  
ENGINEERING, INC.

1698 CLARKSTONE RD., CLEVELAND 12, O.



For a  
*spring*  
with accurate  
*coiling*

see the man with a

## Versatile Torrington Spring Coiler

In spring coiling, the words "Torrington" and "Versatile" are synonymous! When you desire springs produced to meet exacting requirements, just call the professional springmaker who has a Torrington coiler. He's the man who can fill your needs with accuracy, speed and economy. On special springs, our sales department will gladly assist you in finding a source of supply, or help your springmaker devise just the right tooling to produce it.



**MODEL W-11 SPRING COILER**  
The 14 different Torrington Spring Coilers cover a range of wire diameters from .003" to .750".

### SPECIFICATIONS of the Model W-11 Spring Coiler

Wire diameter range: .015" to .072"  
Wire Length per Spring: 0" to 42"  
(Extra Wire Feed Gears Available)  
Coil Range (O.D.): 3/32" to 1-9/16"  
Production: 23 to 190 springs per minute with variable speed drive.  
Torsion and other attachments are available.

**The TORRINGTON**  
MANUFACTURING COMPANY  
TORRINGTON, CONNECTICUT

## Technical Briefs

### Steel Analysis:

British recommend standards for use in spectrographic analysis.

Spectrographic analysis of steel may be more useful if standardization proposals recently discussed at a British Iron & Steel Research Assn. conference are adopted.

Although spectrographic analysis may take minutes, where chemical methods take hours, results often disagree. Steel suppliers and users have had to use chemical methods to find a common standard for analysis.

BISRA proposals include use of a quartz prism spectrograph; graphite counter-electrodes; an exciter with high voltage; and a low capacity condenser with "uncontrolled" spark; calibration and standardization of photographic conditions by the use of specified iron spectral lines and line pairs of fixed intensity ratios for evaluation.

### Plywood Trailer Strong as Steel

New refrigerator trailer made of cellular plastic-laminated plywood was introduced this week. Designed and built by Pressed Steel Car Co., Inc., the new vehicle is claimed to be the first non-metal trailer to have the strength of steel.

Cellular laminates are a relatively new material made by laminating strong plywoods grain-against grain with specially formulated super-strength plastics. Only steel used in the trailer is in the kingpin wearplate assembly and the doorframes. Company officials estimate that 200 tons of metal are saved on every 100 trailers turned out in the company's plant.

### Keel Laid in Cargo Ship Program

Ingalls Shipbuilding Corp. today laid the keel at its Pascagoula, Miss., shipyard for the first of five fast cargo vessels it is building for the Maritime Administration. Cost of each will be about \$5,000,000. The first ship, the "Magnolia State Mariner," honoring Mississippi, will be 525 feet long, have a capacity of 12,500 tons and a speed of 20 knots.

## Technical Briefs

### Electronic Gage:

Measures width of red-hot steel strip . . . Time, material saver

Electronic eyes may soon measure the width of red-hot steel strips moving through rolling mills.

A new device will automatically and continuously measure the width of red-hot steel strips without physically contacting the metal. The device was developed by General Electric Co.

Closer tolerances expected from use of the new gage, calculated to be accurate within  $\pm \frac{1}{8}$  in., will save time and eliminate excessive edge trimming," the manufacturer's report claims.

The gage can continuously measure, indicate and record steel strip width by means of two electronic detectors mounted about 15 feet above the rolling-mill table.

An optical lens, mounted in each detector, reflects the image of each edge of the strip. Illumination for the reflecting image is furnished from the glowing strip passing beneath the gage.

The strip edge image is converted into an electrical pulse signal. Both signals are automatically added together and recorded. Resultant chart readings give a continuous width record of all steel strips rolled. Any deviation from a preset desired width immediately shows on a "deviation indicator," according to Sampson.

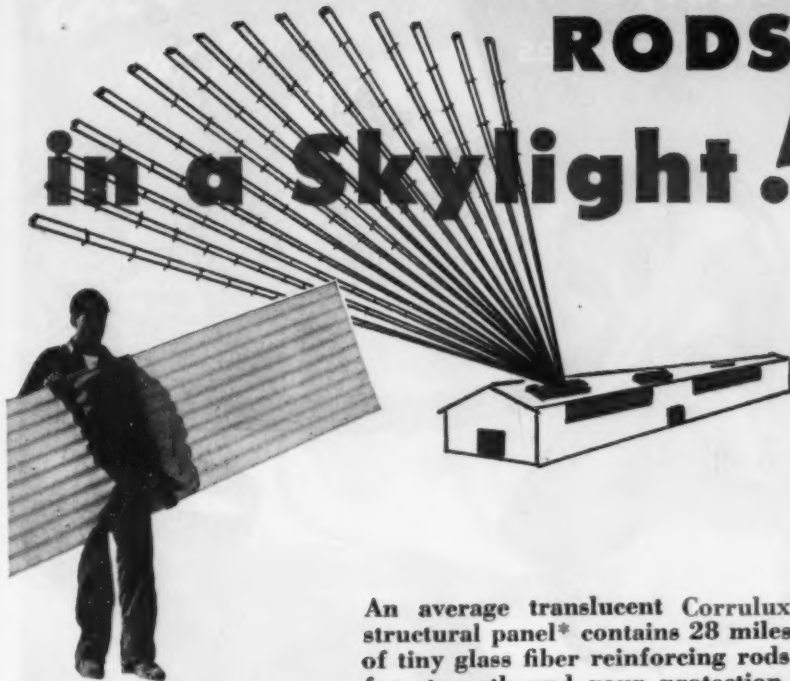
### Allis-Chalmers Forms New Dept.

Allis-Chalmers Manufacturing Co. has merged its electrical and mechanical power departments into a newly-formed power department. Manager of the new unit is R. M. Casper. In addition to electrical and mechanical power sections, the department includes steam turbines and centrifugal pumps.

### Design Fast Drill for Plastics

A new super-fast drill for use on plastic materials has been designed by Westinghouse Electric Corp. The drill substitutes a straight, round shaft for the spiral-grooved shaft in conventional drills.

# 28 MILES of REINFORCING RODS in a Skylight!



An average translucent Corrugulux structural panel\* contains 28 miles of tiny glass fiber reinforcing rods for strength and your protection.

Recent developments have made possible production of tiny glass rods with tensile strengths of over 100,000 psi!

This reinforcing makes Corrugulux shatterproof and strong, ideal for skylighting, sidelighting and partitioning.

Corrugulux diffuses daylight for soft, interior lighting without eye strain.

Corrugulux nests snugly with standard roofing and siding . . . nails, drills, bolts and saws easily . . . can be installed by anyone, on standard purlin spacings, without expensive framing and flashing.

Corrugulux requires no maintenance . . . resists sun, wind, rain, hail, temperature extremes and virtually all industrial fumes . . . is highly resistant to sharp impact, vibration and shock.

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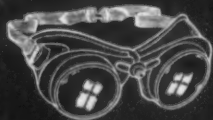


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Technical Briefs

Flame Driller:

High velocity rocket-type flame jets drill blast holes in taconite.

High velocity "rocket" flame jets produced by combustion of oxygen with fuel oil are being used to "pierce" blast holes in the taconite of the Mesabi Range, it was revealed recently at the American Mining Congress.

Experiments with the jet-piercing machine were conducted at the Erie Preliminary Taconite Plant of Pickands Mather & Co., Aurora, Minn.

Starting in July 1950, a concentrated effort was made to apply jet-piercing methods to producing primary blast holes in taconite, and by the end of August 1951, a total of 25,000 linear feet were pierced. Work was done with the JPM-1 machine, the first and only machine available.

The burner uses 10,000 ft of oxygen and 40 gal of fuel per hour, producing a temperature of about 4300° F, and a jet flame velocity up to 6000 fps. Water is required to keep the combustion chamber from being consumed by its own heat, to quench and embrittle the material melted by the flame, and to provide steam for ejecting the material from the blast hole.

Depth of holes is at present limited to 31 ft. Impinging the flame jets on rock causes a thin layer to expand and break away with considerable force. This spalling action is greatly accelerated in chert and quartzite.

Pittsburgh Builds Sheet Mill

Pittsburgh Steel Co. has awarded E. W. Bliss Co. a contract for a 4-stand tandem cold sheet and strip mill, a single stand temper mill and a combination side trimmer and shear line. The equipment will be installed at Allentown, Pa.

The cold mill will have an annual capacity of 380,000 tons. Initial production of sheets is expected in late 1952. A new blooming-slabbing mill will be in operation late this year, and completion of a hot strip mill is expected by August, 1952.

## Technical Briefs

### Motor Control:

Magnetic amplifier provides simple control of mill motors . . .

A magnetic amplifier regulator has been tested on full-scale steel mill equipment at the East Pittsburgh plant of Westinghouse Electric Corp.

Tested under simulated operating conditions, it has successfully controlled a 4000-hp double-armature motor that will be used on a 66-in. tandem cold-reduction mill. The magnetic amplifier, physically and electrically a special form of transformer, is a static device and has no moving parts. Operation is analogous to that of the element vacuum tube.

In the paper, rubber, steel and textile industries, many coretype wheels are required to wind materials. The adjustable-speed motor must hold constant horsepower as adjusted by a regulator controlling its shunt field. The magnetic amplifier is ideally suited to this type of regulating job because it offers economy and simplicity.

### Fast Molds:

Fast cure phenolic speeds cure time on many molded parts . . .

A new fast-cure phenolic compound developed by General Electric Co. speeds cure time on molded parts.

Recommended for applications presently being molded with general purpose phenolic materials, optimum results are possible in compression, transfer, and plunger type molds.

The compound may be preheated to higher temperatures than conventional general purpose materials and cure time is substantially reduced. In many cases, the molding of intricate parts is simplified.

Preheating and mold temperatures can be widely varied to regulate flow, permitting use for many applications.

Combining good physical and electrical properties, the black compound imparts good finish and high gloss to molded parts. Preforming characteristics are claimed excellent and common methods of finishing may be used.

Good News for  
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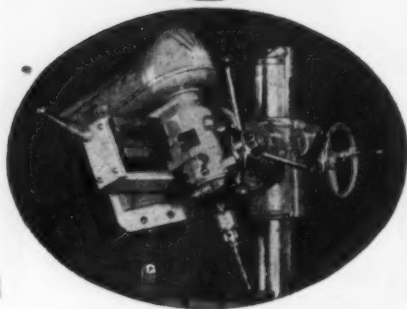
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## Technical Briefs

### Plastic Covers:

Expensive Ordnance Corps machinery will travel in plastic shrouds . . .

Expensive Ordnance Corps machinery will travel under plastic instead of canvas, within a short time.

Several private firms have been aiding the Ordnance Corps in developing cheaper, more efficient methods of protecting equipment in transit from one installation to another. Army personnel now will be able to wrap a 10-ton machine in a 30-lb vinyl chloride shroud when making flat car shipments or otherwise exposing the item to weather.

**Fit All Sizes**—Monsanto Chemical Co. is credited with contributing to research that stabilized the plastic fabric. Standardization of the shrouds to fit many sizes and shapes of equipment was performed by National Transparent Plastics Co., Springfield, Mass.

To prevent rusting of precision surfaces, Ordnance will use, under the plastic, a volatile corrosion inhibitor developed by Shell Oil Co. Assistance in solving problems connected with this additional protection was provided by Marvellum Paper Co., Holyoke, Mass.

As a result of these contributions, there are some 50 sizes of shrouds, each of which can be fitted to the contours of a machine by the use of cotton straps. The cover is tied with ropes laced through grommets to prevent billowing in the wind.

### F-84 Pylons Now in Production

F-84 Thunderbolt pylons are now in quantity production at Westinghouse's Electric Appliance Div. plant, Mansfield, Ohio, under contract for Republic Aviation Corp. Contract negotiations were completed last March, and samples delivered to Republic for testing in mid-summer.

Pylons are streamlined containers beneath each wing of the plane, carrying fuel or bombs. Each pylon has electrical and air control systems for jettisoning its cargo, or, if needed, the pylon itself.



## Technical Briefs

### Back-up Flux:

Fusion welds on stainless steel claimed improved with new flux . . .

Improved types of cost-cutting flux improve quality in fusion welding on corrosion- and heat-resistant metals.

Four types of new back-up flux used to weld stainless steel and other high nickel and cobalt alloys have been developed by Solar Aircraft Co.

In one case use of the flux in the welding of high strength, low alloy steel aircraft engine parts cut rejects 95 pct, cut materials handling by two-thirds, and boosted welding operator efficiency, it is reported.

The fluxes remove surface oxides and prevent oxidation of parts during the welding cycle. This minimizes chipping, grinding, and finishing. They also control weld penetration by permitting higher welding temperatures without "burn-through."

### Check Insulation to Save Fuel

Insulation on heated lines should be checked before winter to conserve fuel. In addition to higher fuel costs, excessive heat losses in hot water and condensate lines can result in freezing.

Outdoor line insulation should be  $\frac{1}{2}$  in. thicker than would be used on indoor lines operating at the same temperature. Asphalt saturated asbestos roofing felt should be used to finish the insulation. No insulation can retain its heat-saving ability if it becomes waterlogged.

### Monsanto Starts Mold Service

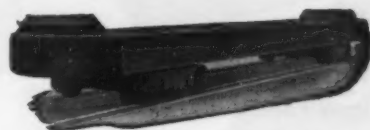
A sample mold service for foundries interested in the resin-sand shell molding process has been organized by Monsanto Chemical Co.

Foundries may obtain a sample mold made from shells of Resinox phenolic resins and sand on patterns sent in to Monsanto. The program is designed to enable foundry personnel to carry on experimental casting operations using the shell mold process.

# ATLAS

## FOR STRIP HANDLING EQUIPMENT

● Strip steel can be handled very economically on rail cars as compared with other means of conveyance. Strip cars can be handled by heavy-duty rubber tired tractors or by locomotives running on the track rails, or they can be self-propelled motor-driven with power supplied by storage battery in the car.

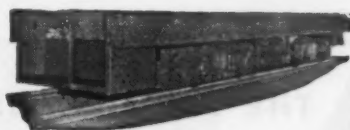
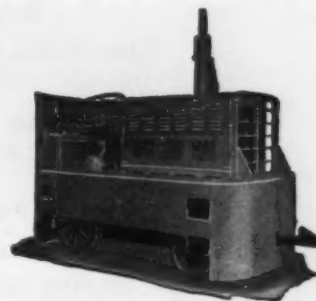


**125-Ton DOUBLE TRUCK CAR**

for handling steel strip in rolls. This car is hauled by tractor shown below.

### SPECIAL HEAVY-DUTY GAS-ELECTRIC TRACTOR

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**135-Ton FLAT CAR**

Powered by storage battery for handling sheet steel.

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Powered by storage battery, operates at slow speed and has operator's platform at each end.



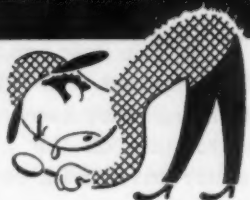
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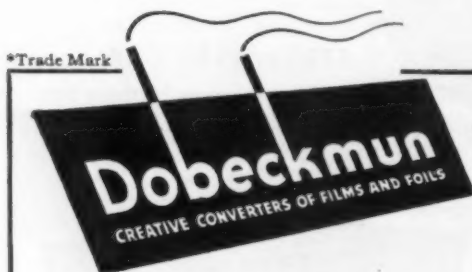
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### Technical Briefs

#### Specific Taps Now Available

Detroit Tap and Tool Co. is marketing "Specific" taps, especially designed and produced for tapping specific materials like cast iron, aluminum, magnesium and other light materials. These special taps are also available for zinc die casting metals, brass and plastics.

Taps are delivered with identification showing the specific class of material for which they are best suited. The company plans to carry specific standard taps as a regular catalog item.

Addition of "Specific" taps to the standard line will eliminate not only the need for specially designed taps, but will cut delivery time and thus speed production.

#### Plastic Deformation Studied

How atomic arrangements in metals determine structural properties is summarized in a symposium on the *Plastic Deformation of Crystalline Solids* now available to the public, the Office of Technical Services of the U. S. Department of Commerce announced today. The 226-p. report may be obtained from OTS for \$3.50.

#### Stainless Steel Machining Aids

Characteristics of stainless steel and data on a wide range of machining operations have been gathered together in *Defense Production Aids (No. 9)* and published by the U. S. Dept. of Commerce.

Recommendations of experienced stainless steel technicians were used in preparing the folder. Details cover the handling of austenitic, ferritic and martensitic stainless steels.

#### Uranium Finds Start New Search

New discoveries of uranium-bearing ores in central Colorado point the way to a more intensive search of the Alma and St. Kevin districts.

The finds were made in Park and Lake counties, according to Geological Survey officials. None of the traces found to date seem to be rich enough for immediate commercial mining, they said.

## Technical Briefs

### Die Life:

Carbide punches and die linings extend tableting press service.

Long life in tableting press service, especially where abrasive compounds are in process, is possible with carbide-tipped punches and carbide-lined dies.

Punch and die life are proportional to the pressure applied and the abrasiveness of the material being tableted. The extreme hardness of the carbide tools at point of impact is the key to long life.

While a standard carbon steel die has an average life of 1 million pressings at a cost of \$2.50, carbide punches and dies are good for an average of 100 million pressings at a cost per million tablets of only 19¢. The punches and dies are made by F. J. Stokes Machine Co.

### Plant Design Major Safety Item

Plant layout is a major factor in industrial safety, according to R. W. Mallick, staff engineer of Westinghouse Electric Corp.

Speaking at the 39th Annual Safety Congress and Exposition in Chicago last week, Mallick pointed out that 40 pct of all industrial accidents are traceable to some source of plant layout or materials-handling defect. Pre-planning of safety by the plant layout engineer is a necessity.

### River Freight Traffic Gains

Freight tonnage on the Monongahela and Allegheny Rivers in 1950 showed a gain of more than 13 pct over the 1949 traffic on the two inland waterways, according to a tabulation made by the Corps of Engineers Dept. of the Army.

Coal traffic was heaviest in both channels, 22,705,163 tons moving on the Monongahela River, and 1,640,523 tons on the Allegheny. Pittsburgh steel mills were large consumers of the coal which moved down the two waterways.

Iron and steel moved by barge down the Monongahela increased from 1,107,766 in 1949 to 1,576,836 in 1950 and on the Allegheny increased from 21,139 to 77,615.

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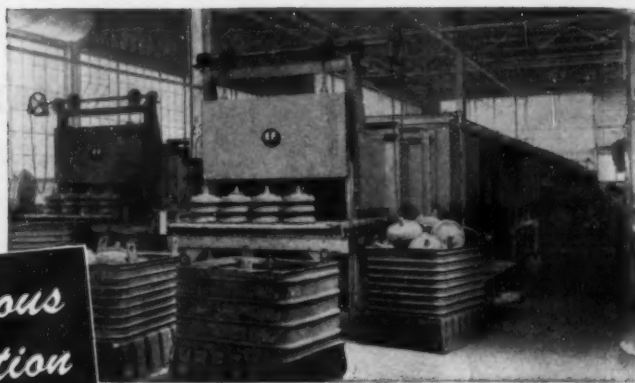
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### Technical Briefs

#### Pickle Liquor:

Sulfuric acid conservation by use of improved methods urged . . .

Conservation of England's supply of sulfuric acid through improved methods in continuous and batch pickling of steel sheet was recommended recently by W. Bullough of the British Iron & Steel Institute.

In batch pickling an average of 5.17 lb of BOV (78 pct sulfuric acid) was used per basis box of black plate.

This figure could be reduced by adequate inhibition of acid attack on base metal; by working down pickle liquor to give waste liquor low in acid and high in iron content (though the iron content of the second pickling tank should be kept low enough to avoid hydrolysis of the ferrous sulfate and subsequent staining of the plates).

Increasing the time the plates were allowed to drain over the tanks; and even by lightly spraying them to drain again would also help.

To reduce drag-out still further the rinse water could be used to spray the plates when taken out of the rinse tank. Mr. Bullough quoted a case where observance of these precautions had reduced acid consumption from 5.17 lb to 4.7 lb BOV per basis box, a saving of 11 pct.

He discussed the various methods of manufacturing sulfuric acid from the ferrous-sulfate crystals remaining after free acid had been recovered from waste pickle liquor. This could be done in pyrites burning acid plants, or in chamber or contact acid plants, though both these methods had to be worked on a large scale to be economic.

BISRA, however, had developed an autoxidation method of producing dilute acid (possibly up to 40 pct). In this process ferrous-sulfate was roasted with coke to give iron oxide and sulfur-dioxide, which was absorbed in water and catalytically oxidized to sulfuric acid.

Mr. Bullough described a pilot plant to test this process in a works in South Wales, at the rate of 1 ton of dilute acid per day. If the process was a success, full scale plants would probably operate at 10 or 20 times that rate.

## Technical Briefs

### How to Winterize Autos

Elmer E. Kohl, general service manager of Oldsmobile, offers the following advice on winterizing your car: (1) Check hose connections to heater and radiator, (2) Use lighter winter lubricants and winter-grade engine oil, (3) Start winter months with a fully charged battery and an efficient electrical system, (4) Spark plugs and distributor points should be checked and adjusted.

### Lead, Zinc Shortage Continues

Present shortages of lead and zinc may be felt another 2 years if current demands continue, Otto Herres, vice-president of Combined Metals Reduction Co., recently told the American Mining Congress.

Recent Washington reports indicate zinc requirements of the free world exceed refinery and smelter production by approximately 110,000 tons for the last 3 months of 1951, Mr. Herres said.

Lead supplies, critically short in this country, are fairly adequate for requirements elsewhere.

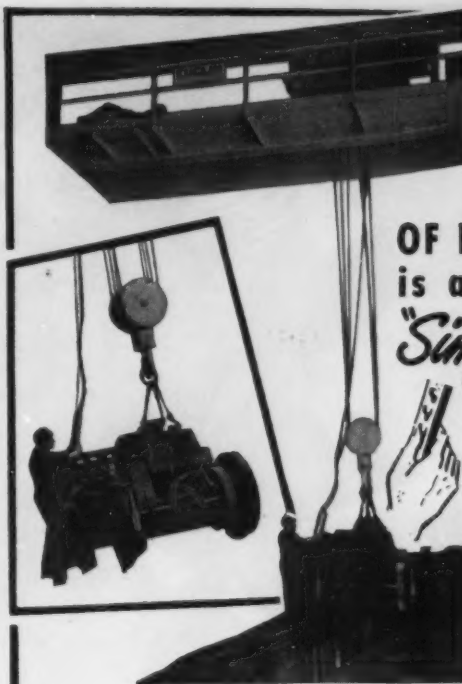
Herres said projects under way for new and expanded production will bring in an additional 110,000 tons of zinc annually from domestic sources. The only planned domestic lead expansion of consequence will increase production by 35,000 tons annually by 1954.

### Willys Plans New Passenger Car

Willys-Overland is spending \$10 million on development and tooling for its new passenger car. Introduction of the new model will depend on availability of materials. Early December is the best guess.

This will not be a "small" car. Wheelbase and overall length will compare favorably with Chevrolet, Plymouth and Ford.

Features—Operating economy, ease of handling, and high compression are to be featured. Its 6-cylinder F-head engine is rated at 30 to 35 miles per gal. With no unamortized dies and fixtures to think about, Willys is not shackled in design.



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Euclid Cranes are built in a range of styles and capacities to meet varied material handling needs. Write for information.

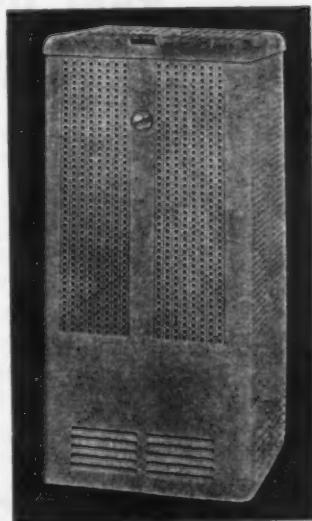


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Available in:

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## The HOLE Story —by— Superior

## Chapter 2

# The Bubble That Beats Trouble to the Punch

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In every tubing job there is one prime requirement. The tube must not leak. Here at Superior we specialize in the production of high quality tubing in all practical metals . . . and we use many methods to insure the superiority of our product.

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The whole story of Superior is one of quality . . . in machines and methods, in men, and in the end result—fine small tubing to do tough jobs well.

This is a story with continuity, for our aim holds always to raise the standards by which we judge Superior tubing . . . and to continue to increase the rate at which we produce it to meet your demands.

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All analyses .010" to 1/2" O.D.  
Certain analyses (.035" max. wall)  
Up to 1 1/2" O.D.



## Restrictions Curb Demand for Conversion Sheets

**But steel producers see tight market continuing . . . Government might direct more plate production to strip mills . . . Demand pressure on bars grows . . . Steel's earnings are lower.**

This week there is no longer any question that the steel sheet conversion market is softening. It's collapsing like a deflated balloon. Conversion's biggest customers, auto firms, are dropping their conversion arrangements like hot potatoes. This includes some of the biggest users in the industry. Unless the trend reverses, sheet conversion will fade out of the picture by the end of the year.

**Prices Skid**—Prices of conversion ingots are sinking fast. A few months ago they sold for well over \$100 a ton. Recently they have been selling for \$85 to \$90 a ton. Last week these same ingots reached a low of \$66 a ton.

A few months ago they were practically unobtainable. Now they are fairly plentiful. At least one Detroit ingot source has a considerable tonnage of them for sale. Scrap dealers who have been supplying conversion ingot makers are looking for other customers.

**Seeking Bars**—Interest in bars and forging billets is still keen. Nearly all conversion now being arranged is aimed at obtaining them. Cold-rolled sheets quickly lose their appeal above market price. At least one mill is now melting wasters and seconds for scrap instead of selling them.

Steel executives are usually pessimistic on the market for steel in automobiles. Auto executives are usually optimistic. This is probably the first time since World War II that they have agreed on the demand for steel in Detroit.

**Blame Washington**—But they don't believe demand from the auto industry has really disappeared—yet. They blame government restrictions. Some feel that Washington has cut auto production too deeply—that National Production Authority will be forced to relax auto production quotas. Others feel it wouldn't make too much difference, because copper is the limiting factor in auto production today.

Sheet demand is softening in other areas, too. But the turn isn't so abrupt. And it isn't being regarded with the significance it is in the Detroit area, which is normally the last stronghold in the steel market to show weakness.

**See Quick Change**—One reason veteran steel producers don't place too much stock in the apparent softening of demand for sheets is that they know the picture can change quickly. It will come as no surprise to them if the government directs more plate to be turned out on strip mills.

Government plate requirements for the first quarter are about 2.3 million tons. This was scaled down from an original estimate of 4 million tons. But steelmakers believe this figure still contains a lot of water. They point out that this would be the greatest quantity of plates ever produced in a single quarter—and it doesn't include a major shipbuilding program. Some mills are voluntarily shifting production from other more profitable products to plate.

**Pressure Growing**—Hot-rolled bars are still very tight. Farm equipment takes a lot of this prod-

uct in the Midwest. Added to this demand is the growing amount being taken by the shell program. In December this program took 2000 tons. In January it is expected to take 2900 tons; in February, 3700; in March, 4300. The rapid growth of demand for shell steel reflects, in part, conversion from brass to steel casings.

The dearth of fourth quarter cancellations has been a bitter disappointment to NPA. Some manufacturers who were slated for sharp cutbacks have gotten part of their allotments restored by appeals. One manufacturer who was due to be cutback 50 pct in the fourth quarter took a trip to Washington and got most of it back. He was told that he had been cutback so drastically because Washington wasn't sure how much he really needed—and could only tell by the amount of fuss he raised about it.

**Earnings Fall**—Anyone who thinks steel companies are getting rich off the defense boom should take a look at their balance sheets. Despite their continuing onslaught on records for production, sales, shipments and expansion, their earnings are on the decline.

Third quarter earnings of the nation's eight top steel producers (rated on capacity) fell 42 pct short of the same period last year. And their earnings for the first 9 months of this year are 23 pct less than they were during the same period in 1950. This means that profit margins are dangerously thin—and still shrinking.

**Fear Wage Hike**—Steel leaders are fearful that union and government will try to carve a wage increase out of their "fat" earnings and end up cutting into the industry's vitals.

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every grade of ZINC  
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## Market Briefs

**buys iron** — Under a 5-year contract scheduled to start in 1953, Allegheny Ludlum Steel Corp. will buy pig iron from Crucible Steel Co. A-L will have an option to extend the agreement for 2 years. Crucible's new blast furnace at Midland, Pa., is scheduled to begin production late next year.

**appliance sales** — Factory sales of home washers in September totaled 313,746 units, 31.2 pct more than in August, according to American Home Laundry Manufacturers' Assn. Automatic tumbler dryer sales were 43,752, up 8.9 pct. Ironers increased 6.4 pct over August.

**raise prices** — U. S. Steel Corp. subsidiaries have raised prices on galvanized sheets, pipe, and wire. Increases reflect recent rise in zinc ceilings, average  $\frac{1}{8}$ ¢ per lb.

**rents mill** — Hetzer Mines, Inc., has leased its Nederland, Colo., tungsten mill to Vanadium Corp. of America. Vanadium will enlarge the mill for greater capacity in processing local ores.

**Bolivia brighter** — Outlook for imports of Bolivian tungsten were brighter this week with announcement by the Export-Import Bank of Washington of a \$1,000,000 loan to Mauricio Hochschild Sociedad Anonima Minera Industrial. The Bank said the firm will make a substantial investment from its own funds for expansion.

**foreign iron** — Imported pig iron is currently going for \$75 to \$85 in the Philadelphia area. Speculators are getting up to a 10 pct cut while regular suppliers are being satisfied with far less. One difficulty with foreign pig is that the analysis is often not precise enough to satisfy quality-conscious Americans.

**substitute wood** — At least three eastern builders have built warehouse type buildings with wooden trusses to support the roof. A 60-ft span was mentioned in one case. Quoted delivery time is extremely fast but fire insurance is higher. Practice is said to be more common in the Far West.

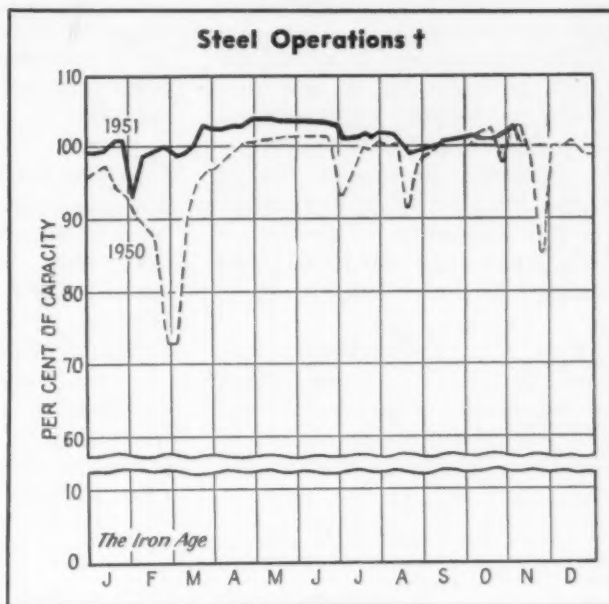
**busy port** — Tennessee Coal, Iron & Railroad Co. will import 3 million tons of ore per year through the port of Mobile, according to a company spokesman. This would amount to slightly more than the entire foreign trade tonnage moving through the port in 1950.

**ore prices** — Ceiling price of brown iron ore goes up 2¢ per long dry ton Nov. 10. Higher price, which was granted to producers in Georgia July 17, now will apply also to producers in other southeastern states—including Alabama, Florida, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia. Higher cost of production and exploration makes the increased price necessary, Office of Price Stabilization acknowledges.

**metal gamble** — Speculators are aggravating the aluminum shortage by holding 100 million lb of scrap off the market in anticipation of higher ceiling prices, according to Irving Lipkowitz, assistant to the president, Reynolds Metals Co.

**more accustomed** — The eastern foundry market is pretty quiet at present. Coke is plentiful, scrap and pig iron are in fair supply—and foundries aren't operating at full capacity.

**approve sale** — Purchase of \$500,000 worth of nitrate of soda under the military assistance program for Yugoslavia has been approved, bringing total Yugoslav military aid to \$54,560,000. Source of the nitrate will be the United States and Chile.



**District Operating Rates—Per Cent of Capacity †**

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	West	Buffalo	Cleveland	Detroit	Wheeling	South	Ohio River	St. Louis	East	Aggregate
Oct. 20	102.0*	108.0	104.0*	102.0	103.0	104.0	101.0*	101.0*	101.0	80.0*	99.5	91.0	101.5	103.0*
Nov. 4	102.0	108.0	104.0	102.0	104.0	104.0	101.5	106.0	101.0	25.0	102.5	91.0	110.0	101.0

† Beginning Jan. 1, 1951, operations are based on annual capacity of 104,229,650 net tons.

\* Revised.



## To Trim CMP Metal Allotments

**Washington thinking tending to realism . . . Aluminum plans up to schedule . . . Copper labor differences largely settled . . . Tin mission may foreshadow new buying**—By R. L. Hatschek.

Defense Production Administrator Manly Fleischmann last week told of plans to cut down the quantity of metals allotted to fit their availability. This seems to indicate a healthy trend toward realism in Washington thinking. He rationalized the 12 pct over-allotment by saying that the government did not expect all Controlled Materials Plan checks to be cashed.

**Aluminum Program**—Aluminum production at an annual rate of 1,528,000 tons is expected by the end of next year, said Mr. Fleischmann, excluding Harvey Machine Co.'s plans. Washington is apparently none too happy about the terms necessary to get Harvey into the business.

The trust busters, however, are quite insistent that a new producer be brought into primary aluminum production regardless of economic drawbacks. Latest names brought up in discussions on this subject are Olin Industries, Anaconda Copper Corp., and Spartan Aircraft Corp.

**Poor Copper Prospects**—Once again the poor long-range picture of the copper supply was cited and manufacturers were urged to substitute aluminum for the red metal in every possible case.

### MONTHLY AVERAGE PRICES

The average prices of the major non-ferrous metals in October based on quotations appearing in THE IRON AGE, were as follows:

	Cents Per Pound
Electrolytic copper, Conn. Valley ..	24.50
Lake Copper, delivered .....	24.625
Straits tin, New York .....	\$1.03
Zinc, East St. Louis .....	19.426
Zinc, New York .....	20.216
Lead, St. Louis .....	18.726
Lead, New York .....	18.926

Meanwhile, the short-range picture remains bleak as the New York dock tie-up continues with thousands of tons of copper sitting in the harbor. November copper raw materials allocations have been cut 10 pct to provide an additional reserve for defense and a new conservation order has been proposed for the plumbing industry.

**Getting Settled**—As of last Friday, the copper industry was almost back to normal with all the "big four" of the nonferrous metal industry having settled differences with the International Union of Mine, Mill and Smelter Workers. Only three local unions remained to negotiate settlement of their differences with 18 companies in the Coeur D'Alene district of Idaho.

**The Tin Mission**—Among the members of the U. S. Government Tin Mission, which has left to study the Malayan tin industry, are representatives of the Reconstruction Finance Corp. and General Services Administration. Since these agencies are in charge of the importing of tin and the procurement of materials for the government, respectively, there has been some speculation as to the ultimate purpose of the mission.

In view of the outcome of the U. S.-Bolivian tin talks, or perhaps the lack of an outcome, there is a feeling that the object of the mission is to pave the way for the resumption of tin buying by the U. S. government. This is further borne out by the placement of tin on the "most critical" list and the announcement that first quarter allocations will be cut below present allotments.

**Fair Price**—It all goes back to the question of what is a fair price for tin. The government, you recall, stopped buying tin in an effort to obtain a fair price and has not yet been able to come to terms with any producer of the metal.

The result, of course, is a reduction in domestic supply despite the fact that world production currently exceeds world consumption.

**Scrap Miseries**—Brass mills, ingot makers, refiners—everyone who uses scrap metals as raw material—are still way behind in their production schedules. But industry has almost stopped blaming people, except for an occasional remark about speculators or government controls, and really started to pitch into a collection drive.

Copper and brass people are now attaching red, white and blue stamps to their stationery. Motto on the stamp reads, "RETURN YOUR SCRAP, brass mills MUST have it to make mill products."

### NONFERROUS METAL PRICES

	Oct. 31	Nov. 1	Nov. 2	Nov. 3	Nov. 5	Nov. 6
Copper, electro, Conn. ....	24.50	24.50	24.50	24.50	24.50	24.50
Copper, Lake delivered ....	24.625	24.625	24.625	24.625	24.625	24.625
Tin, Straits, New York .....	\$1.03	\$1.03	\$1.03	.....	\$1.03	\$1.03*
Zinc, East St. Louis .....	19.50	19.50	19.50	19.50	19.50	19.50
Lead St. Louis .....	18.80	18.80	18.80	18.80	18.80	18.80

\*Tentative

Notes: Quotations are going prices.

(Cents per lb., unless otherwise noted)

50,000 lb. (o.b. ship, pt. frt. allowed)

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb.

(Cents per lb, delivered carloads)

(Cents per lb, 10,000 lb and over)Steel deoxidizing aluminum, notch-bar  
granulated or shot

(Cents per lb, freight allowed, 500 lb lots)

(Cents per lb., f.o.b. shipping points)

### Brass Mill Scrap

(Cents per pound, add  $\frac{1}{2}\epsilon$  per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

## Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

\* Dry copper content.

(Cents per pound, carload lots, delivered to refinery)

## Aluminum

Mixed old cast .....	9.75
Mixed new clips .....	11.00
Mixed turnings, dry .....	9.50
Pots and pans .....	9.25

(Dealers' buying prices, f.o.b. New York  
in cents per pound)

No. 1 heavy copper and wire. 18 $\frac{3}{4}$ —19 $\frac{1}{4}$   
No. 2 heavy copper and wire. 17 $\frac{1}{4}$ —17 $\frac{3}{4}$

Light copper .....	16	—16%
New type shell cuttings .....	16	—16%
Auto radiators (unsweated) ..	14 1/4	—14 1/4%
No. 1 composition .....	18	—18%
No. 1 composition turnings ..	17 1/2	—18%
Unlined red car boxes .....	16 1/2	—17 1/4%
Cocks and faucets .....	15 1/2	—16%
Mixed heavy yellow brass ..	12	—12 1/2%
Old rolled brass .....	15	—15 1/2%
Brass pipe .....	16	—16 1/2%
New soft brass clippings .....	16	—16 1/2%
Brass rod ends .....	15 1/2	—16%
No. 1 brass rod turnings .....	15	—15 1/2%

Alum. pistons and struts . . . . .	6½ — 7½
Aluminum crankcases . . . . .	7½ — 8
2S aluminum clippings . . . . .	10 — 10½
Old sheet and utensils . . . . .	7½ — 8
Borings and turnings . . . . .	5 — 6
Misc. cast aluminum . . . . .	7½ — 8
Dural clips (24S) . . . . .	10 — 11

New zinc clippings . . . . .	13 1/4 — 13 1/2
Old zinc . . . . .	10 — 10 1/4
Zinc routings . . . . .	6 3/4 — 7
Old die cast scrap . . . . .	6 3/4 — 7

Pure nickel clippings	35	—36
Clean nickel turnings	35	—36
Nickel anodes	35	—36
Nickel rod ends	35	—36
New Monel clippings	28	—29
Clean Monel turnings	20	—21
Old sheet Monel	28	—29
Nickel silver clippings, mixed	13	—14
Nickel silver turnings, mixed	12	—13

Soft scrap, lead .....	15¾—16
Battery plates (dry) .....	10½—11
Batteries, acid free .....	7 — 7½

Segregated solids . . . . .	15	—16
Castings . . . . .	14	—15

Block tin	85	—90
No. 1 pewter	60	—65
No. 1 auto babbitt	48	—50
Mixed common babbitt	16 $\frac{1}{4}$	—16 $\frac{1}{2}$
Solder joints	21	—22
Siphon tops	48	—50
Small foundry type	21	—22
Monotype	18 $\frac{1}{2}$	—19
Lino. and stereotype	17 $\frac{1}{2}$	—18
Electrotype	16	—16 $\frac{1}{2}$
Hand picked type shells	10	—11
Lino. and stereo. dross	8 $\frac{1}{2}$	—9
Electro. dross	7 $\frac{1}{2}$	—8

(Cents per lb., unless otherwise noted)

50,000 lb. (o.b. ship, pt. frt. allowed)

Flat Sheet: 0.188 in. 2S, 3S, 30.1¢; 4S, 61S-0, 32¢; 52S, 34.1¢; 24S-0, 24S-0AL, 32.9¢; 76S-0AL, 39.9¢; 0.081 in. 2S, 3S, 51.2¢; 6S, 61S-0, 35.5¢; 52S, 35.6¢; 0.042 in. 24S-0AL, 44.1¢; 76S-0, 76S-0AL, 41.8¢; 0.039 in. 2S, 3S, 42.9¢; 4S, 61S-0, 37.1¢; 52S, 39.9¢; 24S-0, 39.9¢; 76S-0, 41.8¢; 76S-0, 76S-0AL, 42.2¢.  
 Plate  $\frac{1}{4}$  in. and heavier: 2S, 3S-F, 28.3¢; 3S-F, 30.2¢; 52S-F, 31.8¢; 61S-0, 30.8¢; 24S-0, 34.0AL, 32.4¢; 76S-0, 76S-0AL, 38.8¢.  
 Extruded Solid Shapes: Shape factors 1 to 5, 36.5¢ to 74.5¢; 12 to 14, 36.9¢ to 89¢; 24 to 26, 39.9¢ to 11.6¢; 36 to 38, 47.2¢ to 17.0¢.  
 Rod, Rolled: 1.5 to 4.5 in. 2S-F, 3S-F, 37.5¢ to 33.5¢; cold finished, 0.375 to 3 in. 2S, 2S-F, 43.5¢; 4.0 to 35¢.  
 Screw Machine Stock: Rounds, 11S-T3,  $\frac{1}{8}$  in. to 1 1/2 in., 53.5¢ to 42¢;  $\frac{3}{8}$  to 1 1/2 in., 41.5¢ to 39.2¢; 1/4 to 3 in., 35¢ to 36¢; 17S-T4 lower by 1.5¢ per lb. Base 5000 lb.  
 Drawn Wire: Coiled, 0.061 to 0.374 in., 2S, 35.5¢ to 29¢; 52S, 48¢ to 35¢; 66S, 51¢ to 42¢; 17S-T4, 54¢ to 37.5¢; 61S-T4, 48.5¢ to 37¢; 76S-T6, 84¢ to 67.5¢.  
 Extruded Tubing, Rounds: 63-S-T-5, OD in. in. 1 1/4 to 2, 37.5¢ to 54¢; 2 to 4, 33.5¢ to 45.5¢; 4 to 6, 34¢ to 41.5¢; 6 to 9, 34.5¢ to 43.5¢.  
 Roofing Sheet, Flat: 0.019 in. x 28 in. per sheet, 72 in., 1.14¢; 96 in., 1.52¢; 120 in., 11.90¢; 144 in., 2.284¢. Gage 0.24 x 28 in., 72 in., 1.379¢; 96 in., 1.839¢; 120 in., 2.299¢; 144 in., 3.275¢. Coiled Sheet: 0.019 in. x 28 in., 23.2¢ per lb.; 0.024 in. x 28 in., 26.9¢ lb.

(F.O.B. mill, freight allowed)

Sheet and Plate: FSI-O,  $\frac{1}{4}$  in., 63¢; 3/16 in., 55¢;  $\frac{1}{2}$  in., 67¢; B & S Gage 10, 63¢; 12, 72¢; 14, 78¢; 16, 85¢; 18, 93¢; 20, 1.05¢; 22, 1.12¢; 24, 1.16¢. Specification grade higher. Base: 20,000 lb.

Extruded Round Rod: M, diam in.,  $\frac{1}{4}$  to 1.11 in., 74¢;  $\frac{1}{2}$  to  $\frac{3}{4}$  in., 57.5¢;  $1\frac{1}{4}$  to 1.749 in., 53¢;  $2\frac{1}{4}$  to 3 in., 48.5¢. Other alloys higher. Base up to  $\frac{3}{4}$  in. diam, 10,000 lb;  $\frac{3}{4}$  to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft. for perimeters less than size indicated, 0.10 to 0.11 lb, 3.5 in., 62.3¢; 8.2 to 0.25 lb, 5.9 in., 59.3¢; 0.50 to 0.59 lb, 8.6 in., 56.7¢; 1.3 to 2.59 lb, 19.5 in., 53.8¢; 4 to 6 lb, 28 in., 49¢. Other alloys higher. Base, in weight per ft of shape: Up to  $\frac{1}{2}$  lb, 10,000 lb;  $\frac{1}{2}$  to 1.80 lb, 20,000 lb; 1.80 and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057,  $\frac{1}{4}$  in. to 5/16, 1.140; 5/16 to  $\frac{3}{8}$ , 1.126;  $\frac{3}{8}$  to  $\frac{1}{2}$ , 93¢;  $\frac{1}{2}$  to 1 in., 76¢; 0.165 to 0.219,  $\frac{1}{4}$  to  $\frac{3}{8}$ , 51¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in in.: Up to  $1\frac{1}{2}$  in., 10,000 lb;  $1\frac{1}{2}$  in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

## (10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, \$15; Plate, HR, \$12; Wire, rolled and/or drawn, \$10; Bar, HR or forged, \$6. Forgings, \$6.

(Base prices, f.o.b. mill)

	"A" Nickel	Monel
Sheets, cold-rolled . . . . .	77	60 1/2
Strip, cold-rolled . . . . .	83	63 1/2
Rods and bars . . . . .	73	58 1/2
Angles, hot-rolled . . . . .	73	58 1/2
Plates . . . . .	75	59 1/2
Seamless tubes . . . . .	106	93 1/2
Shot and blocks . . . . .		53 1/2

(Freight prepaid on 200 lb)

	Sheet	Rods	Extruded Shapes
Copper .....	41.68		41.28
Copper, h-r .....		37.53	....
Copper, drawn .....		38.78	....
Low brass .....	39.67	39.36	....
Yellow brass .....	38.28	37.97	....
Red brass .....	40.14	39.83	....
Naval brass .....	43.20	37.26	38.52
Lead copper .....		41.58	....
Com'l bronze .....	41.13	40.82	....
Mang. bronze .....	46.92	40.81	42.37
Phos. bronze .....	61.07	61.32	....
Muntz metal .....	41.18	36.74	37.99
Ni silver, 10 pct .....	49.82	52.04	....



# Iron and Steel Scrap Markets

## Government Spotlights Junked Cars

**OPS considers price ceilings for wrecks to bring mill purchases into line . . . NPA hints darkly at requisition of graveyard stocks and proposes 90-day inventory ceiling.**

Junked cars were under the government spotlight as Office of Price Stabilization was considering ceiling prices for the jalopies and National Production Authority an order requiring graveyard operators to turn over heaps under 90-day inventory ceilings. Wreckers protest the ceiling is too low. NPA hinted at requisitions.

OPS' proposed pricing order is designed to keep car wreck scrap in line with other grades. Scrap consumers desperate for metallics have gone far afield in some cases buying car hulks at prices that brought prepared scrap prices much above established scrap price levels.

Wreckers admitted to NPA that from 2 to 3 million cars were ripe for junking but said the 90-day ceiling would force scrapping of postwar heaps on which parts had not been removed. They proposed a 120-day and 500-car level, instead.

The trade is confident some sort of favorable premium will be granted to expedite flow of graveyard scrap. If an NPA order on inventory turnover is enacted, yard operators must have a lenient premium policy to enable them to obey it.

Granting of a skimpy \$25 a ton premium for recovery of abandoned street car rails is seen as insufficient to cover demolition and repaving costs in a great many instances. Where track is almost at street level, embedded in cobblestones, recovery with the \$25 a ton premium is possible but where rail is buried in concrete or covered by asphalt the recovery job is not worth while.

Third Ave. Transit System, New York, told THE IRON AGE it is drawing up specs for recovery

of rail in the Bronx and that a timetable of recovery may be available in 10 days. The system may be able to recover most of the Bronx track under the \$25 premium but it will need leniency from OPS to get at more miles of rail in other boroughs where track is covered.

**Pittsburgh** — Inventory position of district mills has improved in the last several weeks, but some producers are down to a week's supply. Arrival of cold weather has tempered any optimistic notions. OPS is understood to be discouraging mill purchase of automobile wrecks pending possible action on establishment of ceilings for wrecks and locomotives on the hoof. These deals have resulted in delivery of prepared scrap at prices up to \$70 per ton. OPS feels delivered prices are too far out of line.

**Chicago** — Dealers are shipping sizeable tonnages out of the area to mills in Youngstown and other districts in the East. Local mills, in a relatively good position, are complaining because such allocations prevent them from building up inventories in face of winter. Ceilings on unprepared scrap resulted in price reductions of around \$4 to \$6 per gross ton to dealers handling this material. However, most are reported to have unloaded prior to the ceiling and little damage is said to have resulted.

**Philadelphia** — Overgrading has been practically eliminated with a few exceptions noted in bundles. New price set-up has stopped the westward flow of scrap. Some dealers are griping that the ceiling on unprepared scrap cuts down their intake. Foundry grades of cast scrap are still plentiful in comparison to steelmaking grades.

**New York** — Scrap flow seems to have lost a little steam as it adjusts itself to new conditions specified by the OPS order. Too much caution seems to be the affliction. Upgrading is down. One broker warned that OPS

clauses restricting use of certain grades would hold back collections.

**Detroit** — Auto production cutbacks and growing copper shortage have given local scrap trade a breather. And there seems to be less concern about future scrap supply because of stories circulating that steel supply and demand will come into balance. Excellent weather in past months has helped. So has the fact that less scrap is needed for conversion steel. Wasters and seconds, it is reported, are being remelted instead of sold.

**Cleveland** — Amendment 5 brings varied comment but most agree it is good. Some buyers and brokers say it has slowed shipments. Consensus is that shipments are 40 to 50 pct under last month's peak. Snow and freezing weather conditions and possible dealer stockpiling for year-end tax purposes may hurt. Most dealers claim scrap just isn't coming in.

**St. Louis** — Effects of the OPS order were most disappointing to the trade here. Volume reaching this district was small and not what was expected. Mill stocks have been losing ground. Railroad lists have become more frequent, but material sold is yet to be shipped.

**Birmingham** — Scrap trade in this area is picking up a little, but some confusion still exists and dealers are just beginning to get adjusted to the new prices and regulations. Brokers report they are receiving more heavy melting and foundry grades, but little electric furnace scrap is being offered.

**Cincinnati** — Traffic here remains steady with virtually all scrap still allocated to Newport, Ky. Pressure from foundries seems off with cast grades easy. Industrials appear tightest with civilian production cut down. Estimated generation of defense production scrap is 60 to 90 days.

**Boston** — While dealers and others are still trying to absorb the most recent price changes, the market appears somewhat quieter than it has been. Unclean motor blocks, are particularly hard to move.

**Buffalo** — Leading dealers have called halt to local shipments and are devoting their time to out-of-area allocations. Cold and snow have cut collections here.



# ALAN WOOD STEEL . . .

## SPECIALTY PRODUCTS



### STAINLESS CLAD STEEL

**PERMACLAD** Stainless Clad Steel combines the surface characteristics of solid stainless with the easy forming qualities of mild carbon steel—provides corrosion resistance at lower cost.

### ABRASIVE ROLLED STEEL FLOOR PLATE

**A. W. ALGRIP** Abrasive Rolled Steel Floor Plate is made by rolling tough abrasive grain as an integral part of the upper portion of steel plate. Results: Positive protection against slipping, even on steep inclines.



### ROLLED STEEL FLOOR PLATE

**A. W. SUPER-DIAMOND** Rolled Steel Floor Plate, made with an all-over, engineered pattern of raised, skid-resistant diamonds, is easy to clean, easy to match, and grips without a slip.

● Because of Defense Orders and other Government programs we cannot supply all of our customers' requirements

but we are leaving no stone unturned to increase our production and to shorten delivery time.

125 Years of Iron and Steel Making Experience

## ALAN WOOD STEEL COMPANY

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### PRODUCTS OF ALAN WOOD STEEL COMPANY

#### IRON PRODUCTS

"Swede" Pig Iron

Foundry, Malleable, Bessemer and Basic

#### STEEL PRODUCTS

##### PLATES (SHEARED)

Tank, Ship, Boiler, Flange and Structural Qualities

Furnished in carbon, copper, or alloy analyses

A.W. Dynalloy (High Strength Plates)

##### HOT ROLLED SHEETS

Special qualities in carbon, copper, or alloy analyses

A.W. Dynalloy (High Strength Sheets)

#### HOT ROLLED STRIP

Coiled and cut lengths

Carbon, copper, or alloy analyses

#### A.W. ROLLED STEEL FLOOR PLATES

A.W. Algrip Abrasive

A.W. Super-Diamond Pattern

#### STAINLESS-CLAD STEEL

Permaclad Sheets and Plates

Standard and special qualities available in desired finishes

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November 8, 1951

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# Scrap Prices

## Iron and Steel

## SCRAP PRICES

(Maximum basing point prices, per gross ton, set by OPS, effective Feb. 7, 1951. Shipping point and delivered prices calculated as shown below)

GRADES	OPS No.	Basing Points															
		Pittsburgh	Johnstown	Bridgeville	Butler	Midland	Monaca	Sharon	Youngstown	Union	St. Clairsville	Warren	Cleveland	Buffalo	Cincinnati	Middletown	Chicago
No. 1 bundles	1	\$44.00	\$44.00	\$44.00	\$43.00	\$42.50	\$42.00	\$41.00	\$41.15	\$40.00	\$39.50	\$39.00	\$38.00	\$37.00	\$36.00	\$35.00	\$34.00
No. 1 busheling	2	44.00	44.00	44.00	43.00	42.50	42.00	41.00	41.15	40.00	39.50	39.00	38.00	37.00	36.00	35.00	34.00
No. 1 heavy melting	3	43.00	43.00	43.00	42.00	41.50	41.00	40.00	40.15	39.00	38.50	38.00	37.00	36.00	35.00	34.00	33.00
No. 2 heavy melting	4	43.00	43.00	43.00	42.00	41.50	41.00	40.00	40.15	39.00	38.50	38.00	37.00	36.00	35.00	34.00	33.00
No. 2 bundles	5	43.00	43.00	43.00	42.00	41.50	41.00	40.00	40.15	39.00	38.50	38.00	37.00	36.00	35.00	34.00	33.00
Machine shop turnings	6	34.00	34.00	34.00	33.00	32.50	32.00	31.00	31.15	30.00	29.50	29.00	28.00	27.00	26.00	25.00	24.00
Mixed borings and turnings	7	38.00	38.00	38.00	37.00	36.50	36.00	35.00	35.15	34.00	33.50	33.00	32.00	31.00	30.00	29.00	28.00
Shoveling turnings	8	38.00	38.00	38.00	37.00	36.50	36.00	35.00	35.15	34.00	33.50	33.00	32.00	31.00	30.00	29.00	28.00
Cast iron borings	10	38.00	38.00	38.00	37.00	36.50	36.00	35.00	35.15	34.00	33.50	33.00	32.00	31.00	30.00	29.00	28.00
No. 1 chemical borings	26	41.00	41.00	41.00	40.00	39.50	39.00	38.00	38.15	37.00	36.50	36.00	35.00	34.00	33.00	32.00	31.00
Forge crops	11	51.50	51.50	50.50	50.00	49.50	48.50	47.50	47.65	46.50	46.00	45.50	44.50	43.50	42.50	41.50	40.50
Bar crops and plate	12	49.00	49.00	48.00	47.50	47.00	46.00	45.00	45.15	44.00	43.50	43.00	42.00	41.00	40.00	39.00	38.00
Punchings and plate	14	46.50	46.50	45.50	45.00	44.50	43.50	42.50	42.65	41.50	41.00	40.50	39.50	38.50	37.50	36.50	35.50
Electric furnace bundles	15	46.00	46.00	45.00	44.50	44.00	43.00	42.00	42.15	41.00	40.50	40.00	39.00	38.00	37.00	36.00	35.00
Cut struct., plate, 3 ft and less	16	47.00	47.00	46.00	45.50	45.00	44.00	43.00	43.15	42.00	41.50	41.00	40.00	39.00	38.00	37.00	36.00
Cut struct., plate, 2 ft and less	17	49.00	49.00	48.00	47.50	47.00	46.00	45.00	45.15	44.00	43.50	43.00	42.00	41.00	40.00	39.00	38.00
Cut struct., plate, 1 ft and less	18	50.00	50.00	49.00	48.50	48.00	47.00	46.00	46.15	45.00	44.50	44.00	43.00	42.00	41.00	40.00	39.00
Foundry steel, 2 ft and less	20	44.00	44.00	43.00	42.50	42.00	41.00	40.00	40.15	39.00	38.50	38.00	37.00	36.00	35.00	34.00	33.00
Foundry steel, 1 ft and less	21	46.00	46.00	45.00	44.50	44.00	43.00	42.00	42.15	41.00	40.50	40.00	39.00	38.00	37.00	36.00	35.00
Heavy trimmings	24	43.00	43.00	42.00	41.50	41.00	40.00	39.00	39.15	38.00	37.50	37.00	36.00	35.00	34.00	33.00	32.00
Hard steel, 2 ft and less	30	49.00	49.00	48.00	47.50	47.00	46.00	45.00	45.15	44.00	43.50	43.00	42.00	41.00	40.00	39.00	38.00
No. 1 RR heavy melting	RR 1	46.00	46.00	45.00	44.50	44.00	43.00	42.00	42.15	41.00	40.50	40.00	39.00	38.00	37.00	36.00	35.00
Scrap rails, random lengths	RR 14	48.00	48.00	47.00	46.50	46.00	45.00	44.00	44.15	43.00	42.50	42.00	41.00	40.00	39.00	38.00	37.00
Scrap rails, 3 ft and less	RR 16	51.00	51.00	50.00	49.50	49.00	48.00	47.00	47.15	46.00	45.50	45.00	44.00	43.00	42.00	41.00	40.00
Scrap rails, 2 ft and less	RR 17	52.00	52.00	51.00	50.50	50.00	49.00	48.00	48.15	47.00	46.50	46.00	45.00	44.00	43.00	42.00	41.00
Scrap rails, 18 in. and less	RR 18	54.00	54.00	53.00	52.50	52.00	51.00	50.00	50.15	49.00	48.50	48.00	47.00	46.00	45.00	44.00	43.00
Rolling rails	RR 15	53.00	53.00	52.00	51.50	51.00	50.00	49.00	49.15	48.00	47.50	47.00	46.00	45.00	44.00	43.00	42.00
Uncut tires	RR 20	48.00	48.00	47.00	46.50	46.00	45.00	44.00	44.15	43.00	42.50	42.00	41.00	40.00	39.00	38.00	37.00
Cut tires	RR 21	51.00	51.00	50.00	49.50	49.00	48.00	47.00	47.15	46.00	45.50	45.00	44.00	43.00	42.00	41.00	40.00
Cut bolsters and side frames	RR 23	49.00	49.00	48.00	47.50	47.00	46.00	45.00	45.15	44.00	43.50	43.00	42.00	41.00	40.00	39.00	38.00
RR specialties	RR 24, 28, 29	51.00	51.00	50.00	49.50	49.00	48.00	47.00	47.15	46.00	45.50	45.00	44.00	43.00	42.00	41.00	40.00
Solid steel axles	RR 25	58.00	58.00	57.00	56.50	56.00	55.00	54.00	54.15	53.00	52.50	52.00	51.00	50.00	49.00	48.00	47.00
No. 3 steel wheels	RR 27	51.70	51.00	50.00	49.50	49.00	48.00	47.00	47.15	46.00	45.50	45.00	44.00	43.00	42.00	41.00	40.00
Unassorted	RR 35	40.00	40.00	39.00	38.50	38.00	37.00	36.00	36.15	35.00	34.50	34.00	33.00	32.00	31.00	30.00	29.00

## Cast Scrap

(F.o.b. all shipping points)

Grades	OPS No.	
Cupola cast	1	\$49.00
Charging box cast	2	47.00
Heavy breakable cast	3	45.00
Cast iron brake shoes	5	41.00
Stove plate	6	46.00
Clean auto cast	7	52.00
Unstripped motor blocks	8	43.00
Cast iron car wheels	9	47.00
Malleable	10	55.00
Drop broken mach'y cast	11	52.00

Ceiling price of clean cast iron foundry runouts or prepared cupola drops is 75 pct of corresponding grade.

**SWITCHING DISTRICTS**—These basing points include the indicated switching districts: Pittsburgh: Bessemer, Homestead, Duquesne, Munhall, Cincinnati: Newport, St. Louis: Granite City, East St. Louis, Madison, and Federal, Ill. San Francisco: South San Francisco, Niles, Oakland, Clayton: Chester, Chicago: Gary.

**SHIPPING POINT PRICES** (Except RR scrap)—for shipping points within basing points, the ceiling shipping point price is the basing point price, less switching charge. The ceiling for shipping points outside basing points is the basing point price yielding the highest shipping point price, less the lowest established freight charge. Dock charge, where applicable, is \$1.25 per gross ton except: Memphis, 95¢; Great Lakes ports, \$1.50, and New England ports, \$1.75. Maximum shipping point price on No. 1 bundles (prime grade) in New York City is \$36.99 per gross ton with set differentials for other grades. Hudson and Bergen County, N. J., shipping point prices are computed from Bethlehem basing point. All New Jersey computations use all-rail transport. Cast scrap shipping point prices are given in table.

**DELIVERED PRICES** (RR scrap)—Ceiling on-line price of a RR operating in a basing point is the top in the highest priced basing point in which the RR operates. For off-line prices, RR's not operating in basing point non-operating RR's, and RR scrap sold by

someone other than a RR see text of order, THE IRON AGE, Feb. 8, 1951, p. 137-C and amend. 4, CPR 5.

**DELIVERED PRICES** (Except RR scrap)—Ceiling is the shipping point price plus actual freight charge, tax included. Dock charges, where applicable, are as above.

**UNPREPARED SCRAP**—Ceiling price is \$8 a ton less than prepared base grades (No. 1 heavy & No. 1 RR heavy). Scrap suitable for compressing into No. 1 bundles is \$6 less than No. 1 bundles; suitable for compressing into No. 2 bundles, \$8 less than No. 2 bundles. For cast material requiring special preparation, price is breakable cast less preparation costs.

**COMMISSIONS**—Brokers are permitted a maximum of \$1 per gross ton commission which must be separate on the bill.

**ALLOY PREMIUMS**—These alloy extras are permitted: **Nickel**: \$1.25 may be added to price of No. 1 heavy for each 0.25 pct nickel between 1 and 5.25 pct. **Molybdenum**: \$2 may be added to price of No. 1 heavy for molybdenum over 0.15 pct, \$3 for content over 0.65 pct. **Manganese**: \$4 may be added to price of No. 1 heavy or No. 1 RR heavy for content over 10 pct if scrap is in sizes over 8 x 12 x 24 in., \$14 if less than 8 x 12 x 24 in. Manganese premium applicable only if sold for electric furnace use or on NPA allocation. **Silicon**: electric furnace and foundry grade adjustments are not applicable if silicon content is between 0.5 and 1.75 pct. **Chromium**: \$1 may be added if scrap conforms to SAE 52100 analysis. **Multiple Alloys**: if scrap contains two premium alloy elements, total premium may not exceed ceiling premium for any one contained alloy.

**RESTRICTIONS ON USE**—Ceiling prices on some scrap items may fluctuate with use by consumers. If some scrap is purchased for its established specialized use, the ceiling price set in the order stands. But if some special grades are purchased for other uses, the ceiling price grade shall be the price of the scrap grade being substituted. Restrictions on use are placed on the following grades: Chemical borings, wrought iron and re-rolling rails, cupola cast, billet, bloom, and forge crops, Nos. 1 and 2 chemical borings. Ceiling prices on billet, bloom and forge crops, alloy-free turnings, and heavy turnings may be charged

only when shipped directly from industrial producer.

See Amend. 5 to CPR 5 for setting of single price on No. 1 Heavy, No. 2, and No. 2 bundles. No. 1 bundles are made prime grade from which to add or subtract differentials. Amendment also puts dealer to dealer sales under ceilings, permitting a \$1 resale margin, and trucking charges may be added only on shipments of prepared scrap.

## CEILING INTRANSIT PREPARATION CHARGES (Dollars per gross ton)

No. 1 heavy; No. 2 heavy; No. 1 RR heavy; No. 2 RR heavy; No. 1 busheling; No. 2 bundles; electric furnace bundles	\$5.00
No. 1 bundles; briquetted turnings or cast iron borings; No. 1 RR sheet scrap	6.00
Crushing machine shop turnings	3.00
Bar crops and plate, cast steel, punchings and plate, cut structural and plate, 3 ft and under, foundry steel, 2 ft and under, wrought iron	10.00
Structural, plate scrap, 2 ft and less, foundry steel 1 ft and less	11.00
Structural and plate scrap, 1 ft and less	12.00
Rails, 3 ft & less; cut tires; cut bolsters & side frames	4.00
Rails, 2 ft & less	5.00
Rails, 18 in. & less	7.00

## Hamilton, Ontario

(Consumers buying prices, del'd gross ton)

Hvy. melting steel	\$35.00
No. 1 bundles	35.00
No. 2 bundles	34.50
Mechanical bundles	33.00
Mixed, steel scrap	31.00
Rails, remelting	35.00
Rails, re-rolling	28.00
Bushellings	33.00
Bushellings, prepared new factory	32.00
Bushellings, unprepared new factory	28.00
Short steel turnings	32.00
Mixed borings, turnings	32.00
Cast scrap	55.00



## ***billet, bloom & forge crops***

### **use:**

As the ingot is rolled down successively into blooms, billets, bars, etc., irregular ends must constantly be cut by a rotary flying shear. Cut lengths from mill rolling processes become a home scrap known as Billet, Bloom and Forge Crops. This scrap is then prepared in size to conform to the charging area of the electric furnace, providing a heavy, compact load. Since the analysis of these mill crops is generally known, it is a favored scrap grade for the electric furnace.

### **source:**

Scrap resulting from rolling processes in Blooming mills, bar mills, plate mills, etc.

This is one of a series illustrating the many and varied types of scrap required in the making of iron and steel for every use. Our national organization, manned by personnel who is steeped in every phase of scrap knowledge, is ready to meet your every scrap problem.

### **specifications:**

Billet, bloom and forge crops. Billet, bloom, axle, slab, heavy plate and heavy forge crops, not over 0.05% phosphorus or sulphur and not over 0.5% silicon, free from alloys. Must not be less than 2 inches in thickness, not over 18 inches in width and not over 36 inches in length. Must be new material delivered to the consumer directly from the industrial producer.

**CONSULT OUR NEAREST OFFICE FOR THE PURCHASE AND SALE OF SCRAP**  
**LURIA BROTHERS AND COMPANY, INC.**

#### **PLANTS**

LEBANON, PENNA.  
 READING, PENNA.  
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 MICHIGAN  
 MODENA, PENNA.  
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#### **MAIN OFFICE**

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#### **OFFICES**

BIRMINGHAM, ALA. Empire Building	CHICAGO, ILLINOIS 100 W. Monroe St.	HOUSTON, TEXAS 1114 Texas Av. Bldg.	PITTSBURGH, PA. Oliver Building
BOSTON, MASS. Statler Building	CLEVELAND, OHIO 1022 Midland Bldg.	LEBANON, PENNA. Luria Building	PUEBLO, COLORADO 334 Colorado Bldg.
BUFFALO, N. Y. Genesee Building	DETROIT, MICHIGAN 2011 Book Building	NEW YORK, N. Y. 100 Park Avenue	READING, PENNA. Luria Building
ST. LOUIS, MISSOURI 2052 Railway Exchange Bldg.		SAN FRANCISCO, CALIFORNIA Pacific Gas & Elec. Co., Bldg.	

**LEADERS IN IRON AND STEEL SCRAP SINCE 1889**



## Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel:	Nov. 6, 1951	Oct. 30, 1951	Oct. 9, 1951	Nov. 7, 1950
(cents per pound)	1951	1951	1951	1950
Hot-rolled sheets	3.60	3.60	3.60	3.35
Cold-rolled sheets	4.35	4.35	4.35	4.10
Galvanized sheets (10 ga)	4.80	4.80	4.80	4.40
Hot-rolled strip	3.50	3.50	3.50	3.25
Cold-rolled strip	4.75	4.75	4.75	4.21
Plate	3.70	3.70	3.70	3.50
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	36.75	36.75	36.75	34.50

### Tin and Ternplate:

(dollars per base box)				
Tinplate (1.50 lb.) cokes	\$8.70	\$8.70	\$8.70	\$7.50
Tinplate, electro (0.50 lb.)	7.40	7.40	7.40	6.60
Special coated mfg. ternes	7.50	7.50	7.50	6.35

### Bars and Shapes:

(cents per pound)				
Merchant bars	3.70	3.70	3.70	3.45
Cold finished bars	4.55	4.55	4.55	4.15
Alloy bars	4.30	4.30	4.30	3.95
Structural shapes	3.65	3.65	3.65	3.40
Stainless bars (No. 302)	31.50	31.50	31.50	30.00
Wrought iron bars	9.50	9.50	9.50	9.50

### Wire

(cents per pound)				
Bright wire	4.85	4.85	4.85	4.50

### Rails:

(dollars per 100 lb)				
Heavy rails	\$3.60	\$3.60	\$3.60	\$3.40
Light rails	4.00	4.00	4.00	3.75

### Semifinished Steel:

(dollars per net ton)				
Rerolling billets	\$56.00	\$56.00	\$56.00	\$54.00
Slabs, rerolling	56.00	56.00	56.00	54.00
Forging billets	66.00	66.00	66.00	63.00
Alloy blooms billets, slabs	70.00	70.00	70.00	66.00

### Wire Rod and Skelp:

(cents per pound)				
Wire rods	4.10	4.10	4.10	3.85
Skelp	3.35	3.35	3.35	3.15

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Pig Iron:	Nov. 6, 1951	Oct. 30, 1951	Oct. 9, 1951	Nov. 7, 1950
(per gross ton)	1951	1951	1951	1950
No. 2 foundry, del'd Phila.	\$57.97*	\$57.97	\$57.97	\$54.77
No. 2, Valley furnace	52.50	52.50	52.50	49.50
No. 2, Southern Cin'ti.	55.58	55.58	55.58	52.58
No. 2, Birmingham	48.88	48.88	48.88	45.88
No. 2, foundry, Chicago†	52.50	52.50	52.50	49.50
Basic del'd Philadelphia	57.09*	57.09	57.09	53.92
Basic, Valley furnace	52.00	52.00	52.00	49.00
Malleable, Chicago†	52.50	52.50	52.50	49.50
Malleable, Valley	52.50	52.50	52.50	49.50
Charcoal, Chicago	70.56	70.56	70.56	70.56
Ferromanganese†	186.25	186.25	186.25	173.40

\*The switching charge for delivery to foundries in the Chicago district is \$1 per ton.

†Average of U. S. prices quoted on Ferroalloy page.

\*Effective with Oct. 4 freight increase.

### Scrap:

(per gross ton)				
No. 1 steel, Pittsburgh	\$43.00*	\$43.00*	\$44.00*	\$43.75
No. 1 steel, Phila. area	41.50*	41.50*	42.50*	41.50
No. 1 steel, Chicago	41.50*	41.50*	42.50*	39.75
No. 1 bundles, Detroit	41.15*	41.15*	41.15*	39.75
Low phos. Young'n	46.50*	46.50*	46.50*	46.25
No. 1 cast, Pittsburgh	49.00†	49.00†	49.00†	59.75
No. 1 cast, Philadelphia	49.00†	49.00†	49.00†	54.50
No. 1 cast, Chicago	49.00†	49.00†	49.00†	58.50

\*Basing Pt. †Shipping Pt.

Not including broker's fee after Feb. 7, 1951.

### Coke: Connellsville:

(per net ton at oven)				
Furnace coke, prompt	\$14.75	\$14.75	\$14.75	\$14.25
Foundry coke, prompt	17.75	17.75	17.75	16.75

### Nonferrous Metals:

(cents per pound to large buyers)				
Copper, electro, Conn.	24.50	24.50	24.50	24.50
Copper, Lake, Conn.	24.625	24.625	24.625	24.625
Tin, Straits, New York	\$1.03†	\$1.03	\$1.03	\$1.52
Zinc, East St. Louis	19.50	19.50	19.50	17.50
Lead, St. Louis	18.80	18.80	18.80	16.80
Aluminum, virgin	19.00	19.00	19.00	19.00
Nickel, electrolytic	59.58	59.58	59.58	51.22
Magnesium, ingot	24.50	24.50	24.50	24.50
Antimony, Laredo, Tex.	42.00	42.00	42.00	32.00

†Tentative.

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 130 of May 12, 1949, issue.)

## Composite Prices

### Finished Steel Base Price

Nov. 6, 1951	4.131¢ per lb.
One week ago	4.131¢ per lb.
One month ago	4.131¢ per lb.
One year ago	3.837¢ per lb.

	High	Low
1951....	4.131¢ Jan. 2	4.131¢ Jan. 2
1950....	4.131¢ Dec. 1	3.837¢ Jan. 3
1949....	3.837¢ Dec. 27	3.3705¢ May 3
1948....	3.721¢ July 27	3.193¢ Jan. 1
1947....	3.193¢ July 29	2.848¢ Jan. 1
1946....	2.848¢ Dec. 31	2.464¢ Jan. 1
1945....	2.464¢ May 29	2.396¢ Jan. 1
1944....	2.396¢	2.396¢
1943....	2.396¢	2.396¢
1942....	2.396¢	2.396¢
1941....	2.396¢	2.396¢
1940....	2.30467¢ Jan. 2	2.24107¢ Apr. 16
1939....	2.35367¢ Jan. 3	2.26689¢ May 16
1938....	2.58414¢ Jan. 4	2.27207¢ Oct. 18
1937....	2.58414¢ Mar. 9	2.32263¢ Jan. 4
1936....	2.32263¢ Dec. 28	2.05200¢ Mar. 10
1932....	1.89196¢ July 5	1.83910¢ Mar. 1
1929....	2.31773¢ May 28	2.26498¢ Oct. 29

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

### Pig Iron

.....	\$52.72 per gross ton....
.....	52.72 per gross ton....
.....	52.72 per gross ton....
.....	49.69 per gross ton....

High		Low	
\$52.72	Oct. 9	\$52.69	Jan. 2
52.69	Dec. 12	45.88	Jan. 3
46.87	Jan. 18	45.88	Sept. 6
46.91	Oct. 12	39.58	Jan. 6
37.98	Dec. 30	30.14	Jan. 7
30.14	Dec. 10	25.37	Jan. 1
25.37	Oct. 23	23.61	Jan. 2
\$23.61		\$23.61	
23.61		23.61	
23.61		23.61	
\$23.61	Mar. 20	\$23.45	Jan. 2
23.45	Dec. 23	22.61	Jan. 2
22.61	Sept. 19	20.61	Sept. 12
23.25	June 21	19.61	July 6
32.25	Mar. 9	20.25	Feb. 16
19.74	Nov. 24	18.73	Aug. 11
14.81	Jan. 5	13.56	Dec. 6
18.71	May 14	18.21	Dec. 17
Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.			

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

### Scrap Steel

.....	\$42.00 per gross ton....
.....	42.00 per gross ton....
.....	43.00 per gross ton....
.....	41.67 per gross ton....

High		Low
\$47.75	Jan. 30	\$42.00 Oct. 23
45.13	Dec. 19	26.25 Jan. 3
43.00	Jan. 4	19.33 June 28
43.16	July 27	39.75 Mar. 9
42.58	Oct. 23	29.50 May 20
31.17	Dec. 24	19.17 Jan. 1
19.17	Jan. 2	18.92 May 22
19.17	Jan. 11	15.76 Oct. 24
\$19.17		\$19.17
19.17		19.17
\$22.00	Jan. 7	\$19.17 Apr. 10
21.83	Dec. 30	16.04 Apr. 9
22.50	Oct. 3	14.08 May 16
15.00	Nov. 22	11.00 June 7
21.92	Mar. 30	12.67 June 9
17.75	Dec. 21	12.67 June 8
8.50	Jan. 12	6.43 July 6
17.58	Jan. 29	14.08 Dec. 8
Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chi- cago.		

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

*for*  
dependable hardenability  
with maximum properties  
in low alloy boron steels

USE *Grainal* ALLOYS

For boron-treated steels, whether made in the electric furnace or in the open hearth, Grainal alloys are used successfully to increase hardenability.

A larger quantity of Grainal is usually required in electric furnace practice because of the higher nitrogen content characteristic of steels produced by this method. The conversion of the nitrogen content of the steel to an ineffective compound, as is done by some of the components of Grainal, permits a minimum amount of boron to produce the desired effects.

Grainal alloys are metallurgically balanced so that the larger additions required by electric furnace steels can be made safely without exceeding the boron limit for hot shortness.

**VANADIUM CORPORATION OF AMERICA**

520 LEXINGTON AVENUE, NEW YORK 17, N. Y. • DETROIT • CHICAGO • CLEVELAND • PITTSBURGH

MAKERS OF ALLOYS



CHEMICALS AND METALS

UNIVERSITY OF MICHIGAN LIBRARIES

IRON AGE <b>STEEL PRICES</b>	Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page. Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.													
	Pittsburgh	Chicago	Gary	Cleveland	Canton Massillon	Middle- town	Youngs- town	Bethle- hem	Buffalo	Consho- cken	Johns- town	Spar- rows Point	Granite City	Detroit
<b>INGOTS</b>														
Carbon forging, net ton	\$52.00 <sup>1</sup>													
Alloy, net ton	\$54.00 <sup>1-17</sup>													\$54.00 <sup>1-17</sup>
<b>BILLETS, BLOOMS, SLABS</b>														
Carbon, re-rolling, net ton	\$56.00 <sup>1-5</sup>	\$56.00 <sup>1</sup>	\$56.00 <sup>1</sup>						\$56.00 <sup>3</sup>		\$56.00 <sup>3</sup>			
Carbon forging billets, net ton	\$66.00 <sup>1-5</sup>	\$66.00 <sup>1-4</sup>	\$66.00 <sup>1</sup>	\$66.00 <sup>4</sup>	\$66.00 <sup>4</sup>				\$66.00 <sup>3-4</sup>	\$73.00 <sup>10</sup>	\$66.00 <sup>3</sup>			\$66.00 <sup>1-5</sup>
Alloy, net ton	\$70.00 <sup>1-17-6</sup>	\$70.00 <sup>1-4</sup>	\$70.00 <sup>1-6</sup>		\$70.00 <sup>4</sup>			\$70.00 <sup>3</sup>	\$70.00 <sup>3-4</sup>	\$77.00 <sup>10</sup>	\$70.00 <sup>3</sup>			\$73.00 <sup>1-5</sup>
<b>PIPE SKELP</b>	3.35 <sup>1</sup> 3.45 <sup>5</sup>						3.35 <sup>1-4</sup>							
<b>WIRE RODS</b>	4.10 <sup>2</sup> 4.30 <sup>18</sup>	4.10 <sup>2-4-33</sup>	4.10 <sup>6</sup>	4.10 <sup>2</sup>			4.10 <sup>6</sup>		4.10 <sup>3-5</sup>		4.10 <sup>3</sup>	4.20 <sup>3</sup>		
<b>SHEETS</b>														
Hot-rolled (18 ga. & hvr.)	3.60 <sup>1-5-9-15</sup> 3.75 <sup>8</sup>	3.60 <sup>8-23</sup>	3.60 <sup>1-6-9</sup>	3.60 <sup>4-5</sup>		3.60 <sup>7</sup>	3.60 <sup>1-4-6</sup> 4.00 <sup>13</sup>		3.60 <sup>3</sup>	4.00 <sup>2-6</sup>		3.60 <sup>3</sup>	4.30 <sup>12</sup>	3.60 <sup>12</sup> 4.40 <sup>17</sup>
Cold-rolled	4.35 <sup>1-5-9-15-7</sup>		4.35 <sup>1-6-8</sup>	4.35 <sup>4-5</sup>		4.35 <sup>7</sup>	4.35 <sup>4-8</sup>		4.35 <sup>3</sup>			4.35 <sup>3</sup>	5.05 <sup>23</sup>	4.55 <sup>1</sup>
Galvanized (10 gage)	4.80 <sup>1-9-15</sup>		4.80 <sup>1-5</sup>		4.80 <sup>4</sup>	4.80 <sup>7</sup>	5.50 <sup>1-4</sup> 6.00 <sup>9-4</sup>					4.80 <sup>3</sup>	5.90 <sup>23</sup>	
Enameling (12 gage)	4.65 <sup>1</sup>		4.65 <sup>1-8</sup>	4.65 <sup>4</sup>		4.65 <sup>7</sup>	4.65 <sup>5</sup>						5.35 <sup>23</sup>	
Long terme (10 gage)	5.20 <sup>9-15</sup>		5.20 <sup>1</sup>			5.20 <sup>7</sup>	6.00 <sup>9-4</sup>							
Hi str. low alloy, h.r.	5.40 <sup>1-5</sup> 5.75 <sup>9</sup>	5.40 <sup>1</sup>	5.40 <sup>1-8</sup> 5.90 <sup>6</sup>	5.40 <sup>4-5</sup>			5.40 <sup>1-4-13</sup> 5.90 <sup>6</sup>		5.40 <sup>3</sup>	5.85 <sup>2-6</sup>		5.40 <sup>3</sup>	5.95 <sup>12</sup>	
Hi str. low alloy, c.r.	6.55 <sup>1-5</sup> 6.90 <sup>9</sup>		6.55 <sup>1-8</sup> 7.05 <sup>6</sup>	6.55 <sup>4-5</sup>			6.55 <sup>4</sup> 7.05 <sup>6</sup>		6.55 <sup>3</sup>			6.55 <sup>3</sup>	7.10 <sup>12</sup>	
Hi str. low alloy, galv.	7.20 <sup>1</sup>											6.75 <sup>1</sup>		
<b>STRIP</b>														
Hot-rolled	3.60 <sup>9</sup> 4.00 <sup>41-58</sup> 3.75 <sup>28</sup> 3.50 <sup>5-7</sup>	3.50 <sup>6-6</sup>	3.50 <sup>1-6-8</sup>			3.50 <sup>7</sup>	3.50 <sup>1-4-6</sup> 4.00 <sup>13</sup>		3.50 <sup>3-4</sup>	3.90 <sup>2-6</sup>	3.50 <sup>3</sup>	3.50 <sup>3</sup>	4.40 <sup>17</sup> 3.00 <sup>12</sup>	
Cold-rolled	4.65 <sup>5-7-9</sup> 5.00 <sup>28</sup> 5.35 <sup>10-63</sup>	4.90 <sup>8-66</sup>	4.90 <sup>8</sup>	4.65 <sup>2-5</sup>		4.65 <sup>7</sup>	4.65 <sup>4-6</sup> 5.25 <sup>18-49</sup> 5.35 <sup>13-40</sup>		4.65 <sup>3</sup>			4.65 <sup>3</sup>	4.85 <sup>12</sup> 5.45 <sup>17</sup> 5.00 <sup>6-8-11</sup>	
Hi str. low alloy, h.r.	5.79 <sup>9</sup>		5.50 <sup>1</sup> 5.30 <sup>6-5-80</sup>				4.95 <sup>4</sup> 5.50 <sup>1</sup> 5.40 <sup>13</sup> 5.80 <sup>6</sup> 6.20 <sup>4</sup> 6.55 <sup>13</sup> 7.05 <sup>6</sup>		4.95 <sup>3</sup>	5.55 <sup>2-6</sup>		4.95 <sup>3</sup>	5.90 <sup>12</sup>	
Hi str. low alloy, c.r.	7.20 <sup>9</sup>			6.85 <sup>2</sup> 6.70 <sup>3</sup>					6.40 <sup>3</sup>			6.40 <sup>3</sup>		
<b>TINPLATE<sup>1</sup></b>														
Cokes, 1.25-lb base box (1.50 lb, add 25¢)	\$8.45 <sup>1-5-9-15</sup>		\$8.45 <sup>1-6-8</sup>				\$8.45 <sup>4</sup>					\$8.55 <sup>3</sup>		
Electrolytic 0.25, 0.50, 0.75 lb box	0.25 lb base box, \$7.15 <sup>1-4-5-8-9</sup> ; \$7.25 <sup>3-11</sup> ; \$7.35 <sup>23</sup> 0.50 lb, add 25¢; 0.75 lb, add 65¢													
<b>BLACKPLATE, 29 gage</b>														
Hollowware enameling	5.85 <sup>1</sup> 6.15 <sup>1-5</sup>		5.85 <sup>1</sup>				5.30 <sup>4</sup>							
<b>BARS</b>														
Carbon steel	3.70 <sup>1-5</sup> 3.85 <sup>9</sup>	3.70 <sup>1-4-23</sup>	3.70 <sup>1-4-6-8</sup>	3.70 <sup>4</sup>	3.70 <sup>4</sup>		3.70 <sup>1-4-6</sup>		3.70 <sup>3-6</sup>		3.70 <sup>3</sup>			3.85 <sup>31</sup> 4.00 <sup>1-6-8</sup>
Reinforcing	3.70 <sup>1-5</sup>	3.70 <sup>4</sup>	3.70 <sup>1-6-8</sup>	3.70 <sup>4</sup>			3.70 <sup>3-4-6</sup>		3.70 <sup>3-6</sup>		3.70 <sup>3</sup>	3.70 <sup>3</sup>		
Cold-finished	4.55 <sup>2-4-5-52-69-71</sup>	4.55 <sup>2-23-70</sup>	4.55 <sup>4-7-4-73</sup>	4.55 <sup>2</sup>	4.55 <sup>4-8-2</sup>		4.55 <sup>6-67</sup>		4.60 <sup>7-0</sup>					4.75 <sup>3-4</sup>
Alloy, hot-rolled	4.30 <sup>1-17</sup>	4.30 <sup>1-4-23</sup>	4.30 <sup>1-6-8</sup>		4.30 <sup>4</sup>		4.30 <sup>1-6</sup>	4.30 <sup>8</sup>	4.30 <sup>9-4</sup>		4.30 <sup>3</sup>			4.45 <sup>31</sup> 4.65 <sup>12</sup>
Alloy, cold-drawn	5.40 <sup>17-52-69-71-2</sup>	5.40 <sup>4-23-69-70-73</sup> 5.45 <sup>2</sup>	5.40 <sup>4-73-74</sup>		5.40 <sup>4-32</sup>		5.40 <sup>6-25-57</sup>	5.40 <sup>3</sup>	5.40 <sup>3</sup>					5.55 <sup>4</sup> 5.60 <sup>10-6</sup>
Hi str. low alloy, h.r.	5.55 <sup>1-5</sup>		5.55 <sup>1-3</sup> 6.05 <sup>6</sup>	5.55 <sup>4-5</sup>			5.55 <sup>1</sup> 6.05 <sup>6</sup>	5.55 <sup>3</sup>	5.55 <sup>3</sup>		5.55 <sup>3</sup>			
<b>PLATE</b>														
Carbon steel	3.70 <sup>1-5-15</sup> 4.00 <sup>9</sup>	3.70 <sup>1-23</sup>	3.70 <sup>1-6-8</sup>	3.70 <sup>4-5</sup>			3.70 <sup>1-4-6</sup> 3.95 <sup>13</sup>		3.70 <sup>3</sup>	4.15 <sup>2-6</sup>	3.70 <sup>3</sup>	3.70 <sup>3</sup>	4.40 <sup>22</sup>	
Floor plates	4.75 <sup>1</sup>	4.75 <sup>1</sup>	4.75 <sup>8</sup>	4.75 <sup>5</sup>					4.75 <sup>2-6</sup>					
Alloy	4.75 <sup>1</sup>	4.75 <sup>1</sup>	4.75 <sup>1</sup>				5.20 <sup>13</sup>			5.05 <sup>2-6</sup>	4.75 <sup>3</sup>	4.75 <sup>3</sup>		
Hi str. low alloy	5.65 <sup>1-5</sup>	5.65 <sup>1</sup>	5.65 <sup>1-8</sup> 6.15 <sup>6</sup>	5.65 <sup>4-5</sup>			5.65 <sup>4</sup> 5.70 <sup>13</sup> 6.15 <sup>6</sup>			5.90 <sup>2-6</sup>	5.65 <sup>3</sup>	5.65 <sup>3</sup>		
<b>SHAPES, Structural</b>														
Hi str. low alloy	3.65 <sup>1-5</sup> 3.90 <sup>9</sup>	3.65 <sup>1-23</sup>	3.65 <sup>1-8</sup>					3.70 <sup>3</sup>	3.70 <sup>3</sup>		3.70 <sup>3</sup>			
Hi str. low alloy	5.50 <sup>1-5</sup>	5.50 <sup>1</sup>	5.50 <sup>1-8</sup> 6.00 <sup>6</sup>				6.00 <sup>6</sup>	5.50 <sup>3</sup>	5.50 <sup>3</sup>		5.50 <sup>3</sup>			
<b>MANUFACTURERS' WIRE</b>														
Bright	4.85 <sup>2-5</sup> 5.10 <sup>18</sup>	4.85 <sup>2</sup> 4.33-34		4.85 <sup>2</sup>			4.85 <sup>6</sup>	Kokomo = 4.95 <sup>10</sup> 4.85 <sup>13</sup>			4.85 <sup>3</sup>	4.95 <sup>3</sup>	Duluth = 4.85 <sup>2</sup>	
<b>PILING, Steel Sheet</b>	4.45 <sup>1</sup>	4.45 <sup>1</sup>	4.45 <sup>8</sup>						4.45 <sup>3</sup>					



Smaller numbers indicate producing companies. See key at right.  
Prices are in cents per lb unless otherwise noted. Extras apply.

# IRON AGE

## STEEL PRICES

### Key to Steel Producers

- U. S. Steel Co., Pittsburgh
- American Steel & Wire Co., Cleveland
- Bethlehem Steel Co., Bethlehem
- Republic Steel Corp., Cleveland
- Jones & Laughlin Steel Corp., Pittsburgh
- Youngstown Sheet & Tube Co., Youngstown
- Armco Steel Corp., Middletown, Ohio
- Inland Steel Co., Chicago
- Weirton Steel Co., Weirton, W. Va.
- National Tube Co., Pittsburgh
- Tennessee Coal, Iron & R. R. Co., Birmingham
- Great Lakes Steel Corp., Detroit
- Sharon Steel Corp., Sharon, Pa.
- Colorado Fuel & Iron Corp., Denver
- Wheeling Steel Corp., Wheeling, W. Va.
- Geneva Steel Co., Salt Lake City
- Crucible Steel Co. of America, New York
- Pittsburgh Steel Co., Pittsburgh
- Kaiser Steel Corp., Oakland, Calif.
- Portsmouth Div., Detroit Steel Corp., Detroit
- Lukens Steel Co., Coatesville, Pa.
- Granite City Steel Co., Granite City, Ill.
- Wisconsin Steel Co., South Chicago, Ill.
- Columbia Steel Co., San Francisco
- Copperweld Steel Co., Glassport, Pa.
- Alan Wood Steel Co., Conshohocken, Pa.
- Calstrip Steel Corp., Los Angeles
- Allegheny Ludlum Steel Corp., Pittsburgh
- Claymont Steel Corp., Claymont, Del.
- Continental Steel Corp., Kokomo, Ind.
- Rotary Electric Steel Co., Detroit
- Laclede Steel Co., Alton, Ill.
- Northwestern Steel & Wire Co., Sterling, Ill.
- Keystone Steel & Wire Co., Peoria, Ill.
- Central Iron & Steel Co., Harrisburg, Pa.
- Carpenter Steel Co., Reading, Pa.
- Eastern Stainless Steel Corp., Baltimore
- Washington Steel Corp., Washington, Pa.
- Jessop Steel Co., Washington, Pa.
- Blair Strip Steel Co., New Castle, Pa.
- Superior Steel Corp., Carnegie, Pa.
- Timken Steel & Tube Div., Canton, Ohio
- Babcock & Wilcox Tube Co., Beaver Falls, Pa.
- Reeves Steel & Mfg. Co., Dover, Ohio
- John A. Roebling's Sons Co., Trenton, N. J.
- Simonds Saw & Steel Co., Fitchburg, Mass.
- McLouth Steel Corp., Detroit
- Cold Metal Products Co., Youngstown
- Thomas Steel Co., Warren, Ohio
- Wilson Steel & Wire Co., Chicago
- Sweet's Steel Co., Williamsport, Pa.
- Superior Drawn Steel Co., Monaca, Pa.
- Tremont Nail Co., Wareham, Mass.
- Firth Sterling St. & Carbide, McKeesport
- Ingersoll Steel Div., Chicago
- Phoenix Iron & Steel Co., Phoenixville, Pa.
- Fitzsimons Steel Co., Youngstown
- Stanley Works, New Britain, Conn.
- Universal-Cyclops Steel Corp., Bridgeville, Pa.
- American Cladmetals Co., Carnegie, Pa.
- Cuyahoga Steel & Wire Co., Cleveland
- Bethlehem Pacific Coast Steel, San Fran.
- Follansbee Steel Corp., Pittsburgh
- Niles Rolling Mill Co., Niles, Ohio
- Atlantic Steel Co., Atlanta
- Acme Steel Co., Chicago
- Joslyn Mfg. & Supply Co., Chicago
- Detroit Steel Corp., Detroit
- Wycoff Steel Co., Pittsburgh
- Bliss & Laughlin, Inc., Harvey, Ill.
- Columbia Steel & Shaffing Co., Pittsburgh
- Cumberland Steel Co., Cumberland, Md.
- La Salle Steel Co., Chicago
- Monarch Steel Co., Inc., Hammond, Ind.
- Empire Steel Co., Mansfield, Ohio
- Mahoning Valley Steel Co., Niles, Ohio
- Oliver Iron & Steel Co., Pittsburgh
- Pittsburgh Screw & Bolt Co., Pittsburgh
- Standard Forging Corp., Chicago
- Driver Harris Co., Harrison, N. J.
- Detroit Tube & Steel Div., Detroit
- Reliance Div., Eaton Mfg. Co., Massillon, Ohio
- Sheffield Steel Corp., Kansas City
- Plymouth Steel Co., Detroit
- Wickwire Spencer Steel, Buffalo
- Angell Nail and Chaplet, Cleveland
- Mid-States Steel & Wire, Crawfordsville, Ind.
- National Supply, Pittsburgh, Pa.
- Wheatland Tube Co., Wheatland, Pa.
- Mercer Tube & Mfg. Co., Sharon, Pa.
- Woodward Iron Co., Woodward, Ala.
- Gloss-Sheffield Steel & Iron Co., Birmingham
- Hanna Furnace Corp., Detroit
- Interlake Iron Corp., Cleveland
- Lone Star Steel Co., Dallas
- Mystic Iron Works, Everett, Mass.
- Jackson Iron & Steel Co., Jackson, O.
- Globe Iron Co., Jackson, O.
- Pittsburgh Coke & Chemical Co., Pittsburgh
- Shenango Furnace Co., Pittsburgh
- Tennessee Products & Chem. Corp., Nashville
- Koppers Co., Inc., Granite City, Ill.
- Page Steel & Wire Div., American Chain & Cable, Monessen, Pa.
- Wallingford Steel Co., Wallingford, Conn.
- Tonawanda Iron Div., N. Tonawanda, N. Y.
- Pilgrim Drawn Steel Div., Automotive Materials Corp., Plymouth, Mich.

UNIVERSITY OF MICHIGAN LIBRARIES

Kansas City	Houston	Birmingham	WEST COAST Seattle, San Francisco, Los Angeles, Fontana	IRON AGE
			F = \$79.00 <sup>1,9</sup>	INGOTS Carbon forging, net ton
	\$62.00 <sup>9,2</sup>		F = \$80.00 <sup>1,9</sup>	Alloy, net ton
		\$56.00 <sup>1,1</sup>	F = \$75.00 <sup>1,9</sup>	BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton
	\$74.00 <sup>9,3</sup>	\$66.00 <sup>1,1</sup>	F = \$85.00 <sup>1,9</sup> SF, LS, S = \$85.00 <sup>2</sup>	Carbon forging billets, net ton
			F = \$89.00 <sup>1,9</sup> LA = \$90.00 <sup>2</sup>	Alloy net ton
				PIPE SKELP
			Alton = 4.40 <sup>1,2</sup> Worcester = 4.40 <sup>2</sup> Minnequa = 4.35 <sup>1,4</sup> Portsmouth = 4.30 <sup>2,6</sup>	WIRE RODS
		4.50 <sup>3,3</sup>	SF = 4.90 <sup>2</sup> , F = 4.90 <sup>1,9</sup> LA = 4.90 <sup>2,4,6,2</sup>	SHEETS Hot-rolled (18 ga. & hvr.)
		3.60 <sup>4,1,1</sup>	SF, LA = 4.30 <sup>2,4</sup> F = 4.55 <sup>1,9</sup>	Cold-rolled
		4.35 <sup>1,1</sup>	SF = 5.30 <sup>2,4</sup> F = 5.30 <sup>1,9</sup>	Galvanized (10 gage)
		4.80 <sup>4,1,1</sup>	SF, LA = 5.55 <sup>2,4</sup>	Enameling (12 gage)
				Long ternes (10 gage)
		5.40 <sup>1,1</sup>	F = 6.35 <sup>1,9</sup>	Hi str. low alloy, h.r.
			F = 7.50 <sup>1,9</sup>	Hi str. low alloy, c.r.
				Hi str. low alloy, galv.
4.10 <sup>3,3</sup>	4.90 <sup>3,3</sup>	3.50 <sup>4,1,1</sup>	SF, LA = 4.25 <sup>2,4,6,2</sup> F = 4.75 <sup>1,9</sup> , S = 4.50 <sup>2</sup>	STRIP Hot-rolled
			F = 6.30 <sup>1,9</sup> LA = 6.40 <sup>2,7</sup>	Cold-rolled
		5.30 <sup>1,1</sup>	F = 6.20 <sup>1,9</sup> SF, LA = 6.05 <sup>2</sup> S = 6.30 <sup>2</sup>	Hi str. low alloy, h.r.
			F = 6.95 <sup>1,9</sup>	Hi str. low alloy, c.r.
			\$8.55 <sup>1,1</sup> SF = 9.20 <sup>2,4</sup>	TINPLATE Cokes, 1.25-lb base box (1.50 lb. add 25¢)
				Electrolytic 0.25, 0.50, 0.75 lb box
4.30 <sup>3,3</sup>	4.10 <sup>3,2</sup>	3.70 <sup>4,1,1</sup>	SF, LA = 4.40 <sup>2,4</sup>	BLACKPLATE, 29 gage Hollowware enameling
4.35 <sup>3,3</sup>	4.10 <sup>3,3</sup>	3.70 <sup>4,1,1</sup>	SF, S = 4.45 <sup>2</sup> F = 4.40 <sup>1,9</sup> , LA = 4.40 <sup>2</sup>	BARS Carbon steel
			LA = 6.00 <sup>4</sup>	Reinforcing
4.90 <sup>3,3</sup>	4.70 <sup>3,3</sup>		LA = 5.35 <sup>2</sup> F = 5.35 <sup>1,9</sup>	Cold-finished
				Alloy, hot-rolled
			Newark = 5.75 <sup>2,9</sup> Worcester = 5.75 <sup>2</sup> Hartford = 5.85 <sup>4</sup>	Alloy, cold-drawn
		5.55 <sup>1,1</sup>	F = 6.60 <sup>1,9</sup> , SF, S = 6.30 <sup>2</sup> LA = 6.25 <sup>2</sup>	Hi str. low alloy, h.r.
	4.10 <sup>3,3</sup>	3.70 <sup>4,1,1</sup>	F = 4.30 <sup>1,9</sup> S = 4.60 <sup>2</sup>	PLATE Carbon steel
				Floor plates
			F = 5.70 <sup>1,9</sup>	Alloy
		5.65 <sup>1,1</sup>	F = 6.25 <sup>1,9</sup> S = 6.55 <sup>2</sup>	Hi str. low alloy
4.25 <sup>3,3</sup>	4.05 <sup>3,3</sup>	3.60 <sup>4</sup> 3.65 <sup>1,1</sup>	SF = 4.20 <sup>2</sup> , F = 4.25 <sup>1,9</sup> LA = 4.25 <sup>2,4,6,2</sup> , S = 4.30 <sup>2</sup>	SHAPES, Structural
		5.50 <sup>1,1</sup>	S = 6.10 <sup>2</sup> , F = 6.10 <sup>1,9</sup> SF = 6.00 <sup>2</sup> , LA = 6.05 <sup>2</sup>	Hi str. low alloy
5.45 <sup>3,3</sup>	5.25 <sup>3,3</sup>	4.85 <sup>4,1,1</sup>	SF, LA = 5.80 <sup>2,4</sup>	MANUFACTURERS' WIRE Bright

<sup>1</sup> Special coated mfg ternes deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 to 128-lb. deduct \$2.20 from 1.25-lb coke base box.

## Steel Prices

## STAINLESS STEELS

Base price, cents per lb. f.o.b. mill.

Product	301	302	303	304	316	321	347	410	418	430
Ingot rolling	14.25	15.25	16.75	18.25	24.75	20.00	21.75	12.75	14.75	13.00
Slabs billets rerolling	18.50	20.00	22.00	21.00	32.25	28.25	28.50	16.50	20.00	16.75
Forg. disc die blocks rings	34.00	34.25	36.75	38.75	53.00	40.25	44.75	28.00	28.50	28.50
Billets forging	26.25	26.50	28.50	27.75	41.50	31.25	35.00	21.50	22.00	22.00
Bars wires structural	31.25	31.50	34.00	33.00	49.25	37.00	41.50	25.75	28.25	28.25
Plates	33.00	33.25	35.25	35.25	52.00	40.75	45.25	27.00	27.50	27.50
Sheets	41.00	41.25	43.25	43.25	57.00	49.25	53.75	36.50	37.00	39.00
Strip hot-rolled	26.50	28.25	32.50	30.25	48.75	37.00	41.25	23.50	30.25	24.00
Strip cold-rolled	34.00	36.75	40.25	38.75	59.00	48.25	52.25	30.50	37.00	31.00

**STAINLESS STEEL PRODUCING POINTS—***Sheets:* Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38 (type 316 add 4, 5¢), 39; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Ft. Wayne, Ind., 67; Lockport, N. Y., 45.

*Strip:* Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38 (type 316 add 4, 5¢); W. Leechburg, Pa., 25; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 80; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, Pa., 13 (type 301 add ¼¢); Butler, Pa., 7; Wallingford, Conn., 104.

*Bars:* Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42; Ft. Wayne, Ind., 67.

*Wire:* Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Ft. Wayne, Ind., 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28; Monessen, 103; Syracuse, N. Y., 17; Bridgeville, Pa., 59.

*Structurals:* Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44; Syracuse, N. Y., 17.

*Plates:* Brackenridge, Pa., 28 (type 416 add ¼¢); Putler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

*Forged discs, die blocks, rings:* Pittsburgh, 17; Syracuse, 17; Ferndale, Mich., 28; Washington, Pa., 39.

*Forging billets:* Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1; Syracuse, N. Y., 17.

\***ALLEGHENY LUDLUM**—Slightly higher on Type 301; slightly lower on others in 300 Series.

**WASHINGTON STEEL**—Slightly lower on 300 Series except where noted.

## MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Base Col.	Woven Wire Fence Posts Base Col.	Single Loop Bale Ties Base Col.	Twisted Barless Wire Base Col.	Gal. Barbed Wire c./lb.	Mench. Wire Ann'd c./lb.
Alabama City-4	118	126			136	5.70
Alliquippa, Pa.-5	118	132	123		140	5.70
Atlanta-65	121	133	126	126	143	5.95
Bartenville-34	118	130	123	143	143	5.70
Buffalo-85						4.85
Cleveland-86	125					5.70
Cleveland-2						6.15
Crawfordsville 67		132			145	5.95
Donora, Pa.-2	118	130	123	140	140	5.70
Duluth 2	118	130	123	140	140	5.70
Fairfield, Ala.-11	118	130	123		140	5.70
Houston-63	126	138			146	6.10
Johnstown, Pa.-3	118	130		140	146	5.70
Joliet, Ill.-2	118	130	123		140	6.70
Kokomo, Ind.-30	120	132	126	138	142	5.80
Los Angeles-62						6.65
Kansas City 83	130		135		152	6.30
Minnequa-14	123	138	130	128	146	5.95
Morresen-18	124	138			145	5.95
Moline, Ill.-4			136			6.40
Pittsburg, Cal.-24	137			147	156	6.85
Portsmouth-20	124	137			147	6.10
Rankin, Pa.-2	118	130		140	140	5.70
S. San Fran.-14	118	126	140	123	136	5.70
Sparrows, Pt.-3	120		147		160	6.85
Sterling, Ill.-33	118	130	123	140	142	5.85
Struthers, Ohio-6					140	5.70
Torrance, Cal.-24	138					6.70
Worcester-2	124					6.05
Williamsport, Pa.-51 . . .			150			6.85

(1) Alabama City and So. Chicago do not include zinc extra.

## CAST IRON WATER PIPE

*Per Net Ton*

6 to 24-in., del'd Chicago	\$105.30 to \$108.80
6 to 24-in., del'd N.Y....	108.50 to 109.50
6 to 24-in., Birmingham	91.50 to 96.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less .....	\$123.00 to \$130.00
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.	

Base discounts, f.o.b. mills. Base price about \$200 per net ton.

	BUTTWELD																SEAMLESS							
	1/2 In.		3/4 In.		1 In.		1 1/4 In.		1 1/2 In.		2 In.		2 1/2-3 In.		2 In.		2 1/2-3 In.		3 1/2-4 In.					
	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.				
STANDARD																								
T. & C.																								
Sparrows Pt.-3	34.0	12.0	37.0	16.0	39.5	19.5	40.0	20.0	40.5	21.0	41.0	21.5	41.5	22.0										
Cleveland-4	38.0	14.0	39.0	18.0	41.5	21.5	42.9	22.0	42.5	23.0	43.0	23.5	43.5	24.0										
Oakland-19	25.0	3.0	28.0	7.0	30.5	10.5	31.0	11.0	31.5	12.0	32.0	12.5	32.5	13.0										
Pittsburgh-5	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	29.5	8.0	32.5	11.5	34.5	13.5				
Pittsburgh-10	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	3.5	32.5	12.5	34.5	14.5				
Alton, Ill.-32	35.0	13.0	38.0	17.0	40.5	20.5	41.0	21.0	41.5	22.0	42.0	22.5	42.5	23.0										
Sharon-90	36.0	13.0	39.0	17.0	41.5	20.0	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.0										
Pittsburgh-68	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5		32.5		34.5					
Wheeling-15	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0										
Wheatland-19	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5										
Youngstown-8	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	9.5	32.5	12.5	34.5	14.5				
EXTRA STRONG, PLAIN ENDS																								
Sparrows Pt.-3	33.5	13.0	37.5	17.0	39.5	20.5	40.0	21.0	40.5	22.0	41.0	22.5	41.5	23.0										
Cleveland-4	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0										
Oakland-19	24.5	4.0	28.5	8.0	30.5	11.5	31.0	12.0	31.5	13.0	32.0	13.5	32.5	14.0										
Pittsburgh-5	35.5	13.5	39.5	17.5	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	29.0	7.5	33.0	12.0	36.5	13.5				
Pittsburgh-10	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0	10.0	33.0	14.0	36.5	17.5				
Alton, Ill.-32	32.5	12.0	36.5	16.0	38.5	19.5	39.0	20.0	39.5	21.0	40.0	21.5	40.5	22.0										
Sharon-90	35.5	14.0	39.5	18.0	41.5	21.0	42.0	21.5	42.5	22.0	43.0	22.5	43.5	23.0										
Pittsburgh-68	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0		33.0		36.5					
Wheeling-15	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0										
Wheatland-19	35.5	13.5	39.5	17.5	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5										
Youngstown-6	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	26.0	29.0	10.0	33.0	14.0	36.5	17.5				

Galvanized discounts based on zinc, at 17¢ per lb., East St. Louis. For each 1¢ change in zinc, discounts vary as follows:  $\frac{1}{2}$  in.,  $\frac{3}{4}$  in. and 1 in., 1 pt.;  $1\frac{1}{4}$  in.,  $1\frac{1}{2}$  in., 2 in.,  $\frac{3}{4}$  pt.;  $2\frac{1}{2}$  in., 3 in.,  $\frac{1}{2}$  pt. Calculate discounts on even cents per lb. of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb., use 17¢. Jones & Laughlin discounts apply only when zinc price changes.

Threads only, butt welded and seamless, 1 pt. higher discount. Plain ends, butt welded and seamless, 3 in. and under,  $\frac{3}{4}$  pt. higher discount. Butt welded jobbers' discount, 6¢ per lb. East St. Louis zinc price now 19.50¢.

## RAILS, TRACK SUPPLIES

[illegible]

BOILER TUBES	\$ Per 100 ft. cut, 10 to 24 in.
10 in. x 1/2 in. wall	1.00
12 in. x 1/2 in. wall	1.20
14 in. x 1/2 in. wall	1.40
16 in. x 1/2 in. wall	1.60
18 in. x 1/2 in. wall	1.80
20 in. x 1/2 in. wall	2.00
22 in. x 1/2 in. wall	2.20
24 in. x 1/2 in. wall	2.40

F.o.b. Mill	Size		Seamless		Elec. Weld	
	OD-In.	R.W. Ga.	H.R.	C.D.	H.R.	C.D.
Babcock & Wilcox...	2	13	22.67	26.66	21.90	25.88
	2½	12	30.48	35.84	29.57	34.74
	3	12	33.90	39.90	32.89	38.78
	3½	11	42.37	49.89	41.10	48.37
	4	10	52.00	61.88	51.03	60.86
National Tube....	2	13	21.62	26.48	.....	.....
	2½	12	29.65	36.32	.....	.....
	3	12	34.00	41.64	.....	.....
	3½	11	40.34	49.41	.....	.....
	4	10	51.21	62.72	.....	.....
Pittsburgh Steel....	2	13	.....	27.08	.....	.....
	2½	12	30.48	37.15	.....	.....
	3	12	34.95	42.58	.....	.....
	3½	11	41.48	50.54	.....	.....
	4	10	52.65	64.16	.....	.....

## FLUORSPAR

Washed gravel, f.o.b. Rosiclare, Ill.  
Price, net ton; Effective  $\text{CaF}_2$  content:

70% or more	\$43.00
60% or less	40.00



## Miscellaneous Prices

Base price, f.o.b., dollars per 100 lb. \*(Metropolitan area delivery add 20¢ except Birmingham, San Francisco, Cincinnati, New Orleans, St. Paul, add 15¢; Memphis, add 10¢; Philadelphia, add 25¢; New York, add 30¢.)

## REFRACTORIES

### Fire Clay Brick

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5) .....\$94.60  
No. 1 Ohio ..... 88.00  
Sec. quality, Pa., Md., Ky., Mo., Ill. .... 88.00  
No. 2 Ohio ..... 79.20  
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50) ..... 12.75

### Silica Brick

Mt. Union, Pa., Ensley, Ala. ....\$94.60  
Childs, Pa. .... 99.00  
Hays, Pa. .... 100.10  
Chicago District ..... 104.50  
Western Utah and Calif. .... 111.10  
Super Duty, Hays, Pa., Athens, Tex., Chicago ..... 111.10  
Silica cement, net ton, bulk, Eastern (except Hays, Pa.) ..... 16.50  
Silica cement, net ton, bulk, Hays, Pa. .... 18.70  
Silica cement, net ton, bulk, Ensley, Ala. .... 17.60  
Silica cement, net ton, bulk, Chicago District ..... 17.60  
Silica cement, net ton, bulk, Utah and Calif. .... 24.70

### Chrome Brick

Standard chemically bonded, Balt., Chester .....\$82.00

### Magnesite Brick

Standard, Baltimore .....\$104.00  
Chemically bonded, Baltimore .... 93.00

### Grain Magnesite

Domestic, f.o.b. Baltimore, in bulk fines removed .....\$62.70  
Domestic, f.o.b. Chewelah, Wash., in bulk ..... 36.30  
in sacks ..... 41.80

### Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢ .....\$13.75

## COKE

Furnace, beehive (f.o.b. oven) Net Ton  
Connellsville, Pa. ....\$14.50 to \$15.00  
Foundry, beehive (f.o.b. oven)  
Connellsville, Pa. ....\$17.50 to \$18.00  
Foundry, oven coke  
Buffalo, del'd .....\$26.69  
Chicago, f.o.b. .... 23.00  
Detroit, f.o.b. .... 24.00  
New England, del'd ..... 25.00  
Seaboard, N. J., f.o.b. .... 22.75  
Philadelphia, f.o.b. .... 22.70  
Swedeland, Pa., f.o.b. .... 22.60  
Painesville, Ohio, f.o.b. .... 24.00  
Erie, Pa., f.o.b. .... 23.50  
Cleveland, del'd ..... 25.72  
Cincinnati, del'd ..... 25.06  
St. Paul, f.o.b. .... 22.50  
St. Louis ..... 25.40  
Birmingham, del'd ..... 21.69  
Neville Island ..... 23.00

## LAKE SUPERIOR ORES

(51.50% Fe; natural content, delivered lower lake ports) Per gross ton  
Old range, bessemer .....\$8.70  
Old range, nonbessemer ..... 8.55  
Mesabi, bessemer ..... 8.45  
Mesabi, nonbessemer ..... 8.30  
High phosphorus ..... 8.30  
After adjustments for analyses, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

## C-R SPRING STEEL

F.o.b. Mill Cents Per Lb.	CARBON CONTENT				
	0.28 0.40	0.41 0.60	0.61 0.80	0.81 1.05	1.08 1.35
Bridgeport, Conn.-58	5.35	6.80	7.40	9.35	11.85
Carnegie, Pa.-41		6.80	7.40	9.35	11.85
Cleveland-2	4.65	6.45	7.40	9.35	11.85
Detroit-68	5.60	6.65	7.25		
New Castle, Pa.-40	5.35	6.80	7.40	9.35	
New Haven, Conn.-68	5.85	6.75	7.35		
Sharon, Pa.-13	5.35	6.80	7.40	9.35	11.85
Weirton, W. Va.-9	5.35	6.80	7.40	9.35	11.85
Worcester, Mass.-2	4.95	6.75	7.70	9.65	11.85
Youngstown-48		6.80	7.40	9.35	11.85

## WAREHOUSES

Cities	Sheets			Strip		Plates		Shapes		Bars		Alloy Bars			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled	Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled A 4615 As rolled	Hot-Rolled A 4140 Annealed	Cold-Drawn A 4615 As rolled	Cold-Drawn A 4140 Annealed			
Baltimore	5.60	6.84	7.49 <sup>2</sup>	6.04		5.80	6.14	6.04	6.84-6.89	10.24	10.54	11.89	12.19		
Birmingham*	5.60	6.40	6.75	5.55		5.95	5.70	5.55							
Boston	6.20	7.00	7.74	6.15	8.50 <sup>4</sup>	6.48	6.20	6.05	6.79-6.84	10.25	10.55	11.90-12.00	12.20		
Buffalo	5.80	6.40	7.74	5.86		6.05	5.80	5.60	6.40-6.45	10.15-10.85	10.45	11.80	11.95-12.10		
Chicago	5.60	6.40	7.75	5.55		5.80	5.70	5.55	6.30	9.80	10.10	11.45	11.75		
Cincinnati*	5.87	6.44	7.39	5.80		6.19	6.09	5.80	6.61	10.15	10.45	11.80	12.10		
Cleveland	5.80	6.40	8.10	5.69	6.90	5.92	5.82	5.57	6.40	9.91	10.21	11.56	11.86		
Detroit	5.78	6.53	7.89	5.94		5.99	6.09	5.84	6.56	10.11	10.41	11.76	12.06		
Houston	7.00	8.25				6.85	6.50	6.85	9.35	10.35	11.25		12.75		
Indianapolis, del'd	6.00	6.80	8.15	5.95		6.20	6.10	5.95	6.80						
Kansas City	6.00	6.80	7.45	6.15	7.50	6.40	6.30	6.15	7.00	10.40	10.70	12.05	12.35		
Los Angeles	6.35	7.90	8.85	6.40	9.45 <sup>6</sup>	6.40	6.35	6.35	8.20	11.30	11.30	13.20	13.50		
Memphis*	6.33	7.08		6.33		6.43	6.33	6.09	7.16-8.02	6.33	7.32				
Milwaukee	6.38	7.18		6.38		5.94	5.84	5.69	6.44-8.54	9.94	10.24	11.59	11.89		
New Orleans*	5.74	6.54	7.89	5.69		5.94	5.84	5.69	6.44-8.54	9.94	10.24	11.59	11.89		
New York*	5.67	7.19 <sup>1</sup>	8.14 <sup>2</sup>	6.29	8.63 <sup>4</sup>	6.26	6.10	6.12	6.99	10.05-10.15	10.35	11.70	12.10		
Norfolk	5.97	7.24 <sup>1</sup>		6.89		6.58				10.15	10.45	11.80	12.20		
Philadelphia*	6.50 <sup>3</sup>					6.50 <sup>3</sup>	6.60 <sup>3</sup>	6.55 <sup>3</sup>							
Pittsburgh	5.90	6.80	8.00	6.10		6.05	5.90	6.05	6.86	9.90	10.20				
Portland	5.60	6.40	7.75	5.65		5.75	5.70	5.55	6.15	9.80	10.10	11.45	11.75		
Portland	6.60	8.95	8.50	5.95		6.80	6.95	6.90			12.15				
Salt Lake City	7.55		9.10												
San Francisco*	7.95		9.70	8.70		6.05	6.75	7.95	9.00						
San Francisco*	6.65	8.05 <sup>2</sup>	8.55	6.00	9.95 <sup>6</sup>	6.50	6.45	6.45	8.20	11.30	11.30	13.20	13.50		
Seattle	7.05	8.60	9.20	9.05		6.75	6.65	6.75	9.05						
St. Louis	5.80	6.65	8.00	5.80	8.00 <sup>4</sup>	6.13	6.03	5.80	6.55	10.05	10.35	11.70	12.00		
St. Paul*	5.85		8.90 <sup>2</sup>	6.28		6.65			6.85						
St. Paul*	6.16	6.96	8.31	6.11		6.36	6.26	6.11	6.96	10.36	10.66	12.01	12.31		

BASE QUANTITIES (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanizing sheets, for quantity.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 400 to 1999 lb; (4) 6000 lb and over; (5) 1500 to 9999 lb; (6) 2000 to 9999 lb.

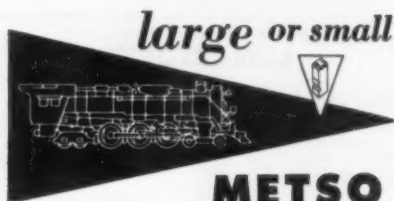
## PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Foundry	Malleable	Bessemer	Low Phos.	Blast Furnace Silvery	Low Phos. Charcoal
Bethlehem-3	54.00	54.50	55.00	55.50			
Birmingham-4	48.38	48.88					
Birmingham-91	48.38	48.88					
Birmingham-92	48.38	48.88					
Buffalo-4	52.00	52.50	53.00				
Buffalo-93	52.00	52.50	53.00				
Chicago-94	52.00	52.50	53.00	53.00		63.75	
Cleveland-2	52.00	52.50	53.00	53.00			
Cleveland-4	52.00	52.50	53.00	53.00	57.00		
Dangerfield, Tex.-93	52.00	52.50	53.00				
Duluth-94	48.00	48.50	48.50				
Erie-94	52.00	52.50	53.00	53.00			
Everett, Mass.-96	52.00	52.50	53.00				
Fontana-19	58.00	58.50	57.50				
Geneva, Utah-16	52.00	52.50	52.50	53.00			
Granite City, Ill.-102	33.90	54.40	54.90				
Hubbard, Ohio-6	52.00	52.50	52.50				
Ironton, Utah-16	52.00	52.50					
Jackson, Ohio-97, 98						62.50	
Lyle, Tenn.-101							66.00
Moresan-18	54.00						
Neville Island-99	52.00	52.50	52.50	53.00			
Pittsburgh-1	52.00			53.00			
Sharpsville-100	52.00	52.50	52.50	53.00			
Steelton-3	54.00	54.50	55.00	55.50	60.00		
Swedeland-26	56.00	56.50	57.00	57.50			
Toledo-94	52.00	52.50	52.50	53.00			
Troy, N. Y.-4	54.00	54.50	55.00		60.00		
Youngstown-6	52.00	52.50	52.50	53.00			
N. Tonawanda, N. Y.-105		52.50	53.00				

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base, (1.75 to 2.25 pct, except low phos., 1.75 to 2.00 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct, \$2 per ton for 0.5 to 0.75 pct nickel, \$1 for each additional 0.25 pct nickel. Subtract 36¢ per ton for phosphorus, content 0.70 pct and over. Silvery iron: Add \$1.50 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. \$1 per ton for 0.75 pct or more phosphorus, manganese as above. Bessemer ferroall on prices are \$1 over comparable silvery iron.





for all clean-ups

From the largest clean-up, e.g., gummy oil deposits from locomotive boilers to the smallest (oily ink in printer's type), count on Metso for a clean surface. Request a sample for trial in your cleaning operation.

Metso's balanced alkali-silica team removes stubborn dirt and grease for keeps. Its special efficiency prevents redeposition of removed soil.

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2

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## Miscellaneous Prices

### BOLTS, NUTS, RIVETS, SCREWS

#### Consumer Prices

(Base discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

#### Machine and Carriage Bolts

	Pct Off List	
	Less Case	C.
1/2 in. & smaller x 6 in. & shorter	15	28 1/2
9/16 in. & 5/8 in. x 6 in. & shorter	18 1/2	30 1/2
3/4 in. & larger x 6 in. & shorter	17 1/2	29 1/2
All diam. longer than 6 in.	14	27 1/2
Lag, all diam. x 6 in. & shorter	23	35
Lag, all diam. longer than 6 in.	21	33
Flow bolts	34	

#### Nuts, Hot Pressed, Cold Punched—Sq

	Pct Off List	
	Less Keg	K.
1/2 in. & smaller	15	28 1/2
9/16 in. & 5/8 in.	12	25
3/4 in. to 1 1/2 in.	23	1
Inclusive	9	23
1 1/2 in. & larger	7 1/2	22

#### Nuts, Hot Pressed—Hexagon

1/2 in. & smaller	26	37	22	34
9/16 in. & 5/8 in.	16 1/2	29 1/2	6 1/2	21
3/4 in. to 1 1/2 in.				
Inclusive	12	25	2	17 1/2
1 1/2 in. & larger	8 1/2	23	2	17 1/2

#### Nuts, Cold Punched—Hexagon

1/2 in. & smaller	26	37	22	34
9/16 in. & 5/8 in.	23	35	17 1/2	30 1/2
3/4 in. to 1 1/2 in.				
Inclusive	19 1/2	31 1/2	12	25
1 1/2 in. & larger	13	25	6 1/2	21

#### Nuts, Semi-Finished—Hexagon

	Reg.		Hvy.	
	Less Case	C.	Less Case	C.
1/2 in. & smaller	35	45	28 1/2	39 1/2
9/16 in. & 5/8 in.	29 1/2	40 1/2	22	34
3/4 in. to 1 1/2 in.				
Inclusive	24	36	15	28 1/2
1 1/2 in. & larger	13	26	8 1/2	23

#### Light

7/16 in. & smaller	35	45
1/2 in. thru 5/8 in.	28 1/2	39 1/2
3/4 in. to 1 1/2 in.		
Inclusive	26	37

#### Stove Bolts

	Pct Off List	
	Less Case	C.
Packaged, steel, plain finished	48—10	
Packaged, plated finish	31—10	
Bulk, plain finish**	62*	

\*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

\*\*Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

#### Rivets

	Base per 100 lb.	
	Less Case	C.
1/2 in. & larger		\$7.85
7/16 in. & smaller		36
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa.		

#### Cap and Set Screws

	Pct Off List	
	Less Case	C.
Hexagon head cap screws, coarse or fine thread, 1/4 in. thru 5/8 in. x 6 in., SAE 1020, bright		54
3/4 in. thru 1 in. up to & including 6 in.		48
1/4 in. thru 5/8 in. x 6 in. & shorter		46
high C double heat treat		41
3/4 in. thru 1 in. up to & including 6 in.		35
Milled studs		16
Flat head cap screws, listed sizes		34
Phillister head cap, listed sizes		
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter		53

#### S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.	
High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.	
Carloads	21.60
Ton lots	23.75
Less ton lots	25.25
Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.	
Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

### ELECTRODES

Cents per lb., f.o.b., plant threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb.
GRAPHITE		
17, 18, 20	60, 72	17.85
8 to 16	48, 60, 72	17.85
	48, 60	19.57
	48, 60	20.95
4, 5	40	21.50
3	24, 30	22.61
2 1/2	24, 30	23.15
2	24, 30	25.36
CARBON		
40	100, 110	8.93
35	65, 110	8.93
30	65, 84, 110	8.93
24	72 to 104	8.93
20	84, 90	8.93
17	60, 72	8.93
14	60, 72	8.93
10, 12	60	8.93
8	60	9.10

### CLAD STEEL

Base prices, cents per pound, f.o.b., mill

Stainless-carbon	Plate	Sheet
No. 304, 20 pct.		
Coatesville, Pa. (21)...	*29.5	
Washgtn., Pa. (39)...	*29.5	
Claymont, Del. (29)...	\$28.00	
Conshohocken, Pa. (26)	*27.50	
New Castle, Ind. (55)...	*26.50	*25.50
Nickel-carbon		
10 pct Coatesville (21)...	32.5	
Inconel-carbon		
10 pct Coatesville (21)...	40.5	
Monel-carbon		
10 pct Coatesville (21)...	33.5	
No. 302 Stainless-copper		
stainless, Carnegie, Pa. (60)		77.00
Aluminized steel sheets, hot dip, Butler, Pa. (7)...		7.75

\*Includes annealing and pickling, or sandblasting.

### TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	\$1.30
18	4	1	—	5	\$2.12
18	4	2	—	—	\$1.65
1.5	4	1.5	8	—	\$81.9
6	4	2	6	—	\$6.54
High-carbon chromium					
Oil hardened manganese					
Special carbon					
Extra carbon					
Regular carbon					
Warehouse prices on and east of Mississippi are 3.5¢ per lb higher. West of Mississippi, 5.5¢ higher.					

### METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.l.f.	
New York, ocean bags.	7.4¢ to 9.04
Canadian sponge iron, del'd, In East	10.00¢
Domestic sponge iron, 98+ % Fe, carload lots	15.5¢ to 17.04
Electrolytic iron, annealed, 99.5+ % Fe	42.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+ % Fe	53.5¢
Hydrogen reduced iron, minus 300 mesh, 98+ % Fe	63.0¢ to 80.04
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+ % Fe	83.0¢ to 114.8
Aluminum	31.5¢
Brass, 10 ton lots	30.00¢ to 33.25¢
Copper, electrolytic, 10.75¢ plus metal value	
Copper, reduced	10.00¢ plus metal value
Cadmium, 100-199 lb 95¢ plus metal value	
Chromium, electrolytic, 99% min., and quantity, del'd.	\$3.50
Lead	7.5¢ to 12.0¢ plus metal value
Manganese	67.0¢
Molybdenum, 99%	\$2.75
Nickel, unannealed	88.0¢
Nickel, annealed	95.0¢
Nickel, spherical, unannealed	95.0¢
Silicon	36.5¢
Solder powder, 7.0¢ to 9.0¢ plus met. value	
Stainless steel, 302	83.00¢
Stainless steel, 316	\$1.30
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	\$6.00
Zinc, 10 ton lots	23.0¢ to 30.5¢



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President, Allegheny Ludlum Steel Corporation

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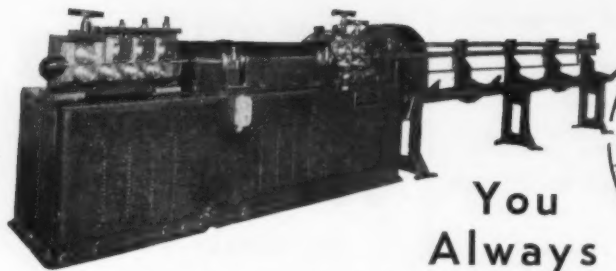
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## Miscellaneous Prices

### ELECTRICAL SHEETS

22 Ga. H-R cut lengths

F.o.b. Mill Cents Per Lb.	Armature	Ele.	Motor	Dynamo	Transf. 72	Transf. 85	Transf. 95
Beech-Bottom-15	7.25	8.80	9.30	9.85	10.40	11.00	11.60
Brackenridge-28	7.25	8.80	9.30	9.85	10.40	11.00	11.60
Follansbee-63	6.75	7.25	8.50	9.10	9.65	10.20	10.75
Granite City-22	7.95	9.20					
Ind. Harbor-3	6.75	7.25					
Mansfield-75	7.25	7.75	9.00	9.80			
Niles, O.-64	7.05	7.55					
Vandergrift-1	6.75	7.25	8.50	9.30	9.85	10.40	11.00
Warren, O.-4	6.75	7.25	8.50	9.30	9.85	10.40	11.00
Zanesville-7	6.75	7.25	8.50	9.30	9.85	10.40	11.00

### Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max. Si.)

0.06% C	30.50	0.20% C	29.00
0.10% C	30.00	0.50% C	28.25
0.15% C	29.75	1.00% C	27.50
2.00% C			26.75
65-69% Cr, 4-9% C			25.00
62-66% Cr, 4-6% C, 6-9% Si			23.00

### Foundry Ferrochrome

Contract prices, cents per lb of alloy. Noncontract prices add 0.25¢ per lb. High carbon 8 mesh and down.

62 to 66% Cr, 5 to 7% C, 7 to 10% Si	21.50
Carloads, bulk	21.50
Carloads, packed	24.15
Ton lots, packed	27.50

### High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.10% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 1¢ for each additional 0.25% N.

### Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.

0.10% max. C	13.14
0.50% max. C	1.10
9 to 11% C	1.80

### Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed: lump 4-in. x down, bulk 2-in. x down, 21.75¢ per lb of contained Cr plus 12.40¢ per lb of contained Si.

Bulk 1-in. x down, 21.90¢ per lb contained Cr plus 12.60¢ per lb contained Si.

### Calcium-Silicon

Contract price per lb of alloy, dumped, delivered.

30-33% Ca, 60-65% Si, 2.00% max. Fe	19.00
Carloads	22.10
Ton lots	22.10
Less ton lots	22.60

### Calcium-Manganese-Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si	20.00
Carloads	22.50
Ton lots	22.50
Less ton lots	23.00

### V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 58-62% Cr, 17-19% Si, 8-11% Mn.

Ton lots	16.50
Less ton lots	17.75

### Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. SI 48 to 52%, Ti 9 to 11% Ca 5 to 7%.

Carload packed	18.00
Ton lots to carload packed	19.00
Less ton lots	20.50

### SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Cr, 20% Fe, 1/2 in. x 12 mesh.

Ton lots	17.00
Less ton lots	19.00



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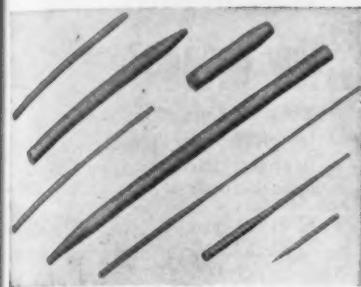
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### Ferroalloy Prices

#### Ferromanganese

78-82% Mn. maximum contract base price, gross ton, lump size.  
F.o.b. Niagara Falls, Alloy, W. Va., \$185  
Ashtabula, O. \$187  
F.o.b. Johnstown, Pa. \$185  
F.o.b. Sheridan, Pa. \$188  
F.o.b. Etna, Clairton, Pa. \$188  
\$2.00 for each 1% above 82% Mn. penalty, \$2.15 for each 1% below 78%.  
Briquets—Cents per pound of briquet, delivered, 66% contained Mn.  
Carload, bulk 10.95  
Ton lots 12.55

#### Spiegeleisen

Contract prices gross ton, lump, f.o.b.  
16-19% Mn 19-21% Mn  
3% max. Si 3% max. Si  
Palmerton, Pa. \$74.00 \$75.00  
Pgh. or Chicago 75.00 76.00

#### Manganese Metal

Contract basis, 3 in. x down, cents per pound of metal, delivered.  
96% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.  
Carload, packed 34.75  
Ton lots 36.25

#### Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.  
Carloads 28  
Ton lots 30  
Less ton lots 32

#### Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb. of contained Mn 19.15¢

#### Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.  
Cast Turnings Distilled  
Ton lots \$2.05 \$2.95 \$3.75  
Less ton lots 2.40 3.30 4.55

#### Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.  
Carload bulk 9.90  
Ton lots 11.55  
Briquet, contract basis carlots, bulk delivered, per lb of briquet 11.15  
Ton lots 12.75

#### Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$92.50 gross ton, freight allowed to normal trade area.  
Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$90.00. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add \$1.00 for each 0.50% Mn over 1%.

#### Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.  
96% Si, 2% Fe 21.70  
97% Si, 1% Fe 22.10

#### Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 3 lb Si briquets.  
Carload, bulk 6.95  
Ton lots 8.55

#### Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.  
25% Si 20.00 75% Si 14.30  
50% Si 12.40 85% Si 15.55  
90-95% Si 17.50

#### Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd. Mn 85-90%.  
Carloads Ton Less  
0.7% max. C, 0.06% P, 90% Mn 26.25 25.10 29.30  
0.07% max. C 25.75 27.60 28.80  
0.15% max. C 25.25 27.10 28.30  
0.30% max. C 24.75 26.60 27.80  
0.50% max. C 24.25 26.10 27.30  
0.75% max. C 21.25 23.10 24.30  
7.00% max. Si



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# Ferroalloy Prices

Alsilfer, 30% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	9.90¢
Ton lots	11.30¢
Calcium molybdate, 45-40%, f.o.b. Langeloth, Pa., per pound contained Mo.	\$1.15
Ferrocolumbium, 50-60%, 2 in. x D, contract basis, delivered, per pound contained Cb.	\$4.90
Ton lots	4.95
Less ton lots	
Ferro - Tantalum - columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta	\$3.75
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo.	\$1.32
Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$3 unitage, per gross ton	\$65.00
10 tons to less carload	75.00
Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	\$1.35
Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	\$1.50
Less ton lots	1.55
Ferrotitanium, 15 to 18%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton	\$177.00
Ferrotungsten, standard, lump or 1/4 x down, packed, per pound contained W, 5 ton lots, delivered	\$5.00
Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.	
Openhearth	\$3.00-\$3.10
Crucible	3.10-3.20
High speed steel (Primus)	3.20-3.25
Molybdenic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa.	\$1.14
bags, f.o.b. Washington, Pa., Langeloth, Pa.	\$1.13
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk lump	14.50¢
Ton lots, bulk lump	15.75¢
Less ton lots, lump	16.25¢
Vanadium pentoxide, 86-89% V <sub>2</sub> O <sub>5</sub> , contract basis, per pound contained V <sub>2</sub> O <sub>5</sub>	\$1.28
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00¢
Zirconium, 12-15% contract basis, lump, delivered, per lb of alloy.	
Carload, bulk	7.00¢
<b>Boron Agents</b>	
Contract prices per lb of alloy, del. Borosil, f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B	\$5.25
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, Ti, 15-21% B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4.6-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.	
Ton lots, per pound	10.00¢
Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots	\$1.20
F.o.b. Wash., Pa.; 100 lb up	
10 to 14% B.	.85
14 to 19% B.	1.20
19% min. B.	1.50
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	
No. 1	\$1.00
No. 6	.68¢
No. 79	.50¢
Manganese-Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd	
Ton lots	\$1.46
Less ton lots	1.57
Nickel-Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	
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Silicaz, contract basis, delivered.	
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- How long should these alloys remain in the deoxidizing solution? See *Immersion Charts* on pages 9 and 10.
- What effects do different immersion times have on resistance? See *Resistance Curves* on page 11.
- What's the best rinse temperature after cleaning? after deoxidizing? See page 12.
- Do you have efficient controls for the concentration and temperature of your cleaning and deoxidizing solutions? See page 14.
- What advantages should you insist on when selecting materials for preparing aluminum for spot welding? See page 17.

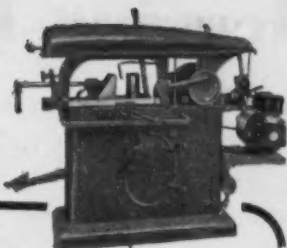
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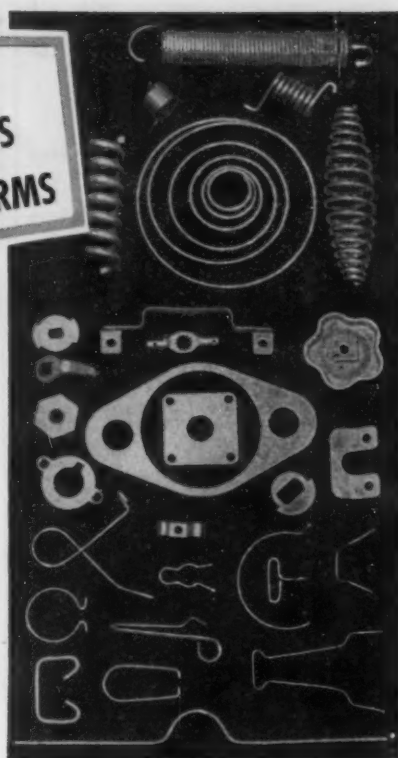
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NEWS OF USED, REBUILT AND SURPLUS MACHINERY

**Held In Check—Uncertainty** about price regulations and lack of availability of desirable equipment have curbed the tempo of used and rebuilt machine tool activity in the Detroit area. Business is spotty. Some dealers have been able to keep high volume moving steadily; others report volume down from 3 months ago.

Reaction to the new price regulation (CPR 80, effective Oct. 13) has been mostly favorable. The order seems to be well written. Language is simple. Biggest problem faced by the trade so far is getting information needed to comply with the regulation. Also, dealers say it is surprising how many people in industry aren't aware of the regulation.

**Getting Prices—When** necessary price information isn't available a dealer may follow several courses of action: (1) He may ask Office of Price Stabilization for a ruling. This may require an interpretation from Washington. So far, answers to such questions have met considerable delay. (2) The dealer may certify that prices are believed to comply with the regulation. If an exception is found later, the dealer agrees to negotiate any differences. This saves time, but it also subjects the dealer to uncertainty he would understandably like to avoid.

**Oversight—Failure** to print a price book has been a disappointment to dealers who had expected such a book would now be available. Necessary data has been assembled, it is reported, but there has been no appropriation for printing the book.

Efforts to get prices of machines from the makers have brought varied response. Most machine tool builders have cooperated. Only a few refusals have been reported. In other instances builders have written long letters, although they might have merely entered figures on a questionnaire.

**Curbs Bidding—The** new price regulation already has succeeded in one important respect: Wild bidding at auction sales has stopped. Such sales, of course, are also governed by the new order.

**Manpower—Rebuilders** know they have to keep busy in order to keep their help. Despite steady pressure from other industries they haven't been hurt badly by labor losses so far. By the same token expanding rebuilders haven't been able to hire the type of experienced help they need to keep pace with their growth.

For one thing, good rebuilders need special skills not associated with regular production experience. Special problems are constantly cropping up in rebuilding jobs. Solving them calls for either long experience in the rebuilding field, or high calibre ingenuity.

**Subcontracting—One** way to keep busy is through subcontracting business. True, this is not really their line. But many rebuilders can make a variety of parts, and some can turn out complete assemblies. Those who have branched into building lines of course have the advantage.

Growing inquiries for tools are coming from subcontractors in other lines. This trend is expected to continue. Defense output is growing; it's expected to reach its peak about the middle of next year and to hold for some months before it starts to recede very gradually. Subcontractor inquiries should continue somewhat parallel with this activity.

**Foreign Factor—Some** in the trade see foreign machines as a threat to their business for used and rebuilt machines. Competition is sharpened by promises of early delivery. Feeling is that these promises might bear so much weight as to make customers forget about other important factors, such as parts.



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